MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2001

Lavina Wetland Lavina, Montana



Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION 2701 Prospect Avenue Helena, MT 59620-1001

July 2002

Project No: 130091.030

Prepared by:

WETLANDS WEST INC. P.O. Box 6786 Bozeman, MT 59771

Under contract to:

LAND & WATER CONSULTING, INC. P.O. Box 8254 Missoula, MT 59807



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Appendix A: Figures 2 - 3

Appendix B: Completed 2001 Wetland Mitigation Site Monitoring Form

Completed 2001 Bird Survey Forms

Completed 2001 Wetland Delineation Forms

Completed 2001 Field and Full Functional Assessment Forms

Completed 2001 Macroinvertebrate Sampling Results

Appendix C: 1989 MDT Wetland Monitoring Report

Completed 1998 Mitigation Monitoring Form

Completed 1998 Field Functional Assessment Form

Site Map of the Lavina/Ryegate Mitigation Projects

Appendix D: Bird Survey Protocol

Macroinvertebrate Sampling Protocol

GPS Protocol

Appendix E: Representative Photographs



1.0 INTRODUCTION

This report summarizes methods and results from the 2001 monitoring program at the Montana Department of Transportation's (MDT) Lavina wetland mitigation site. Originally this site was one of five sites for mitigation near the town of Lavina. The mitigation site, heretofore known as Lavina, was originally known as one of a pair of mitigation sites (Lavina/Ryegate); however, for purposes of reporting and future monitoring, the two sites have been separated. The other mitigation sites in this area were not included in this assessment.

This report summarizes methods and results from the 2001 monitoring program at the MDT Lavina wetland mitigation site. The Lavina site is located in Golden Valley County approximately nine miles east of Ryegate, north of and adjacent to Highway 12, in Section 4, Township 6 North, Range 21 East (**Figure 1**). The wetland was constructed to mitigate wetland impacts associated with the MDT Lavina/Ryegate project in Watershed #10 of the Billings District. The project impacted 1.3 acres within the corridor of US Highway 12 between Lavina and Ryegate. Mitigation sites within the Lavina/Ryegate area total 2.9 acres (**Appendix C**).

The Lavina site was historically an oxbow of the Musselshell River (**Figure 2, Appendix A**). The oxbow was separated from the main channel by railroad construction around 1910. MDT expanded the existing wetland 0.45 acre oxbow wetland to almost 2.0 acres in size. The site was visited during the 2001 field season and again in June, 2002 to assess compliance with Section 404 requirements.

2.0 METHODS

2.1 Monitoring Dates and Activities

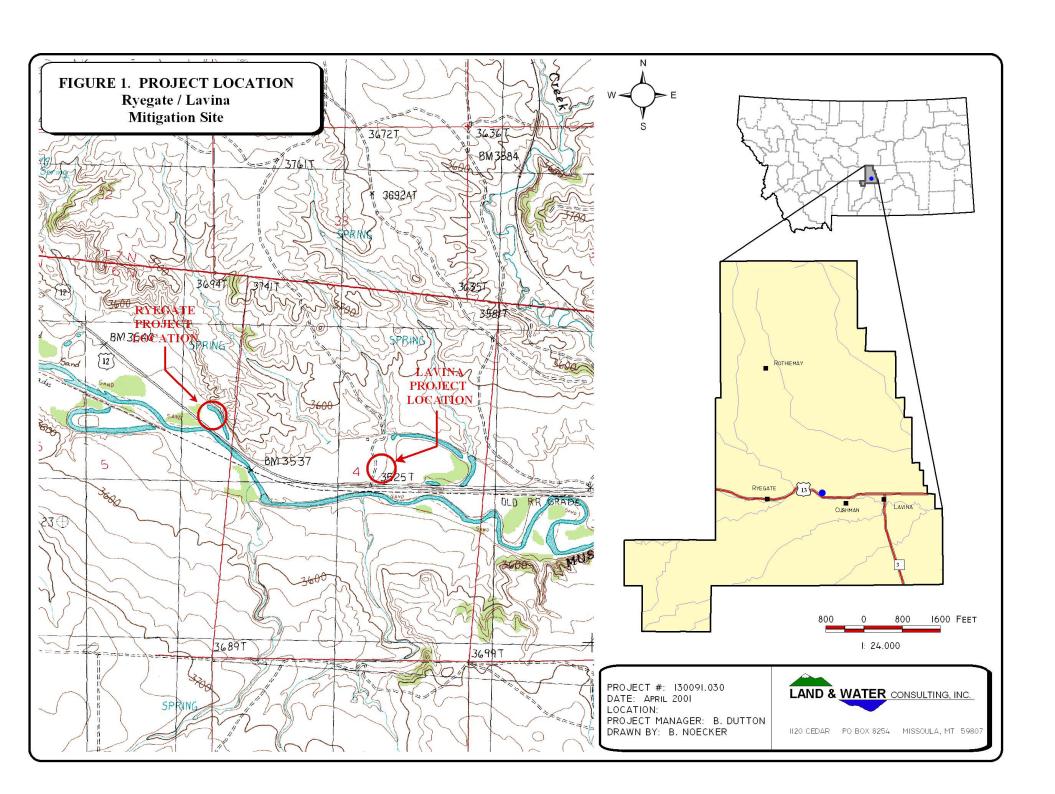
The Lavina wetland was monitored on August 13, 2001 and June 30, 2002. All information contained within the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected during August 2001 and certain aspects of the wetland were reexamined during June 2002. Activities and information conducted/collected included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; GPS data points; functional assessment; and, assess maintenance needs of any bird nesting structures and inflow and outflow structures (non-engineering).

2.2 Hydrology

Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual. Hydrology data were recorded on the Routine Wetland Delineation Data Form (**Appendix B**) at each wetland determination point.

All additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). The boundary between emergent vegetation and open water was mapped on the aerial photograph (**Figure 3, Appendix A**). There are no groundwater monitoring wells at the site.





2.3 Vegetation

General vegetation types were delineated on an aerial photograph during the site visits (**Figure 3**, **Appendix A**). Coverage of the dominant species in each community type is listed on the monitoring form (**Appendix B**) and a comprehensive plant species list for the entire site was compiled. Observations from past years will be compared with new data to document vegetation changes over time. Woody species were not planted on this site.

One transect was established during the 2001 monitoring event to represent the range of current vegetation conditions. The location of this transect is shown on **Figure 2**, **Appendix A**. Percent cover for each species was recorded on the vegetation transect form within the monitoring form (**Appendix B**). The transect will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. Transect ends were marked with metal fence posts and their locations recorded with the GPS unit. Photos of the transect were taken from both ends during the site visit.

2.4 Soils

Soils were evaluated during the site visit according to the procedure outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current terminology used by NRCS was used to describe hydric soils.

2.5 Wetland Delineation

A wetland delineation was conducted within the assessment area according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The information was recorded on the COE Routine Wetland Delineation Forms (**Appendix B**). The wetland/upland and open water boundary was used to calculate the wetland area. This wetland was reportedly evaluated in 1988 and 1989 and monitored in 1998 by MDT biologists; the report (1989) and data sheets (1998) are included in **Appendix C**.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations were recorded on the wetland monitoring form during the site visit (**Appendix B**). Indirect use indicators were also recorded including tracks, scat and burrows. A comprehensive wildlife species list for the entire site was compiled and could be updated as new species are encountered should the MDT want to do so. Observations from past years could be compared with new data to determine if wildlife use is changing over time.



2.7 Birds

Bird observations were recorded during the site visit according to the established bird survey protocol (**Appendix D**). A general, qualitative bird list has been compiled using these observations. Observations will be compared between years in future studies. There are eight (8) bird nesting boxes at Lavina: 4 bluebird, 3 wood duck, and 1 kestrel.

2.8 Macroinvertebrates

One (1) macroinvertebrate sample was collected during the 2001 site visit following the protocol (**Appendix D**). Samples were preserved as outlined in the sampling procedure and sent to a laboratory for analysis. The approximate sampling location is indicated on **Figure 2**, **Appendix A**.

2.9 Functional Assessment

A functional assessment form was completed in 2002 for the Lavina wetland mitigation site using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were collected on a condensed data sheet included in the mitigation site monitoring form (**Appendix B**). The remainder of the assessment was completed in the office. A functional assessment completed in 1998 is included in **Appendix C**.

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the wetland buffer, the monitored area, and the vegetation transect. A description and compass direction for each photograph were recorded on the wetland monitoring form.

During the 2001 monitoring season, each photograph point was marked on the ground with a wooden stake and the location recorded with a resource grade GPS (**Appendix E**). The approximate locations are shown on **Figure 2**, **Appendix A**. All photographs were taken using a 50 mm lens.

2.11 GPS Data

During the 2001 monitoring season survey points were collected using a resource grade Trimble, Geoexplorer III hand-held GPS unit. Points collected included: the vegetation transect beginning and ending locations; photograph locations; and the jurisdictional wetland boundary. In addition, during the August 2001 monitoring season survey points were collected at four (4) landmarks recognizable on the air photo for purposes of line fitting to the topography.

2.12 Maintenance Needs

No inflow or outflow structures exist at this site, although the outlet is restricted. The outlet will be examined for non-engineering damage and the bird boxes examined for need of repair.



3.0 RESULTS

3.1 Hydrology

The source of hydrology for the Lavina wetland is groundwater and surface runoff. During the site visit the area was approximately 70% inundated. The average depth of water was one foot deep. The open water boundary followed the edge of Community Type 2 (*Typha latifolia*) indicated on **Figure 3**, **Appendix A**. There are no inflow/outflow control structures at the site.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and in the monitoring form (**Appendix B**). Five (5) vegetation communities were mapped on the mitigation area map (**Figure 3**, **Appendix A**). The communities include: Type 1, *Agropyron cristatum*; Type 2, *Typha latifolia; Type 3, Populus angustifolia; Type 4 Populus angustifolia (saplings); and, Type 5 Sagittaria spp.* Dominant species within each community are listed on the monitoring form (**Appendix B**). The dominant vegetation community was Type 2, cattails, which comprised less than 25% of the site. Most of the site was covered with shallow, open water. Approximately 50% of the site's perimeter was developing hydrophytic vegetation.

Table 1: 2001 Lavina Wetland Vegetation Species List

Scientific Name	Common Name	Indicator status
Agropyron cristatum	crested wheatgrass	NI
Agropyron smithii	western wheatgrass	FACU
Artemesia cana	silver sage	FACU
Centaurea maculosa	spotted knapweed	NI
Cirsium arvense	Canada thistle	FACU+
Convolvulus arvensis	field bindweed	NI
Crepis spp.	hawksbeard	FACU
Cynoglossum officinale	houndstongue	FACU
Elaeagnus angustifolia	Russian olive	FAC
Hordeum jubatum	barley foxtail	FAC
Juncus spp.	rush	FAC-OBL
Kochia spp.	summer cypress	FAC-FACU
Malva spp.	scarlet globemallow	NI
Populus angustifolia	narrow-leaf cottonwood	FACW
Sagittaria spp.	arrow-head	OBL
Salix spp.	willow	FAC-OBL
Scirpus validus	soft-stem bulrush	OBL
Trifolium spp	clover	FAC-UPL
Typha latifolia	cattail	OBL
Vicia spp.	Vetch	NI-UPL



The vegetation transect results are detailed in the monitoring form (**Appendix B**) and are summarized below.

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į	Transect 1	Upland Type 1	Wetland	Open Water	Total	End	
9	Start	(17')	Type 2 (8')	(25')	50'	Transect 1	ĺ
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<i>,,,,,,,,,,,,</i>	4

3.3 Soils

The NRCS soil survey has not been completed for the Lavina area. The sample points at Lavina were identified as SP-3 (upland) and SP-4 (wetland) and the Ryegate sample points were identified as SP-1 and SP-2 because the MDT has historically treated these sites as one area. Soils at SP-3 consisted of impenetrable cobbles in a matrix of sandy loam; a soil pit was not excavated due to the cobble layer. Soils at SP-4 were black (10YR 2/1) from 0-18 inches and had a strong sulfidic odor.

3.4 Wetland Delineation

The delineated wetland boundary is depicted on **Figure 3**, **Appendix A**. The wetland boundary encompasses 1.75 acres with 1.03 acres of shallow (<1'), open-water habitat. The COE data forms are included in **Appendix B**. The site was identified as "Site 5" in the MDT 1989 report and appears to include both Lavina and Ryegate. The report states that 0.45 acres were impacted on an existing oxbow with a goal of creating a 1.0 acre wetland with higher wetland functions. The net acreage gain would then be 1.3 acres for Lavina.

3.5 Wildlife

Wildlife species are listed in **Table 2.** Activities and densities associated with these observations area included on the monitoring form in **Appendix B**. Wildlife observations were limited to deer tracks, beaver sign and frogs. Five (5) nesting structures were located (3 bluebird and 2 wood duck); 3 of the bluebird boxes were occupied by unknown bird species.

Table 2. Fish and Wildlife Species Observed at the Lavina Wetland Mitigation Site

Table 2. I ish and Wilaife Species Observed at the Eavitha	Temma Muganon Suc
AMPHIBIANS	
Frogs (Rana spp.)	
BIRDS	
Killdeer (Charadrius vocife rous)	
Redtail hawk (Buteo jamaicensis)	
Redwing blackbird (Agelaius phoeniceus)	
Tree swallow (Tachycineta bicolor)	
MAMMALS	
Beaver (Castor canadensis)	
White-tailed deer (Odocoileus virginianus)	



3.6 Macroinvertebrates

The macroinvertebrate sampling results are included in **Appendix B**. Rhithron, Inc. summarized the results as follows: Optimal biotic conditions were suggested by the scores calculated for this site (Rhithron, Inc.). Low biotic index value and the presence of two mayfly taxa implied good water quality. High taxa richness suggested ample habitat availability.

3.7 Functional Assessment

Completed functional assessment forms are included in **Appendix B** and summarized below in **Table 3**. The functional assessment conducted in 1998 by MDT (L. Urban) was for this site titled on the assessment sheet as "Site 1 - Lavina West". (This site is identified as Site #5 on the MDT map included in **Appendix C**.)

The data show the site to have a total of 12.25 functional units with a Category III ranking in 2001; the 63% ranking nearly qualified for a Category II ranking (65%). The data from 1998 totaled 6.24 functional units or approximately half of that in 2001. The wetland in 1998 was shown to be a Category II wetland via the general wildlife ranking as high (1.0) rather than high (0.8) in 2001. Overall, the 1998 and 2001 assessment of the wetland were very comparable and are presented below in **Table 3**.

Table 3: Summary of 1998 and 2001 Wetland Function/Value Ratings and Functional Points at the Lavina Wetland Mitigation Project

3		
Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	1998	2001
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0)
MNHP Species Habitat	Low (0.1)	High (0.8)
General Wildlife Habitat	High (1.0)	High (0.8)
General Fish/Aquatic Habitat	Moderate (0.7)	NA
Flood Attenuation	Low (0.2)	Low (0.2)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)
Sediment, Nutrient, Toxicant Removal	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	NA	High (1.0)
Production Export/Food Chain Support	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Moderate (0.5)	Moderate (0.5)
Recreation/Education Potential	Low (0.3)	Low (0.1)
Actual Points/Possible Points	6.5/11	7.0/11
% of Possible Score Achieved	59%	63%
Overall Category	II	III
Total Acreage of Assessed Wetlands within Easement	Wetland = 0.96 ac	1.75 ac
Functional Units (acreage x actual points)	6.24 fu	12.25 fu
Net Acreage Gain	0.51 ac	1.3 ac
Net Functional Unit Gain	No Data for pre -con.	6.01 fu
Total Functional Unit "Gain"		6.01 fu



3.8 Photographs

Representative photographs taken from photo points and transect ends are included in **Appendix E.**

3.9 Maintenance Needs/Recommendations

No problems were noted regarding the outlet dike. Only five (5) bird boxes were located and it is unknown what happened to the other nest structures.

3.10 Current Credit Summary

Construction of Site #5 caused the loss of 0.45 acres of wetland. The site is now 1.75 acres of wetland, an overall site gain of 1.3 acres. The 2001 functional assessment data indicate that the Lavina site is a Category III wetland with a total of 12.25 functional units; the data from 1998 totaled 6.24 functional units or nearly half of that in 2001 (**Table 3**). The wetland in 1998 was shown to be a Category II wetland as a result of the general wildlife ranking as high (1.0) rather than high (0.8) in 2001. Overall, the Lavina wetland mitigation site appears to be functioning as intended and has exceeded the mitigation goal both in acres and the increase in functional units.

4.0 REFERENCES

- Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. Prepared for Montana Department of Transportation. May 1999.
- Montana Department of Transportation. 1989, 1998. Wetland Monitoring Report DA Permit No. MT 2SB OXT 2 009336 Ryegate East F 14-4(1) 129.
- US Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual*. US Army Corps. Washington, DC.



Appendix A

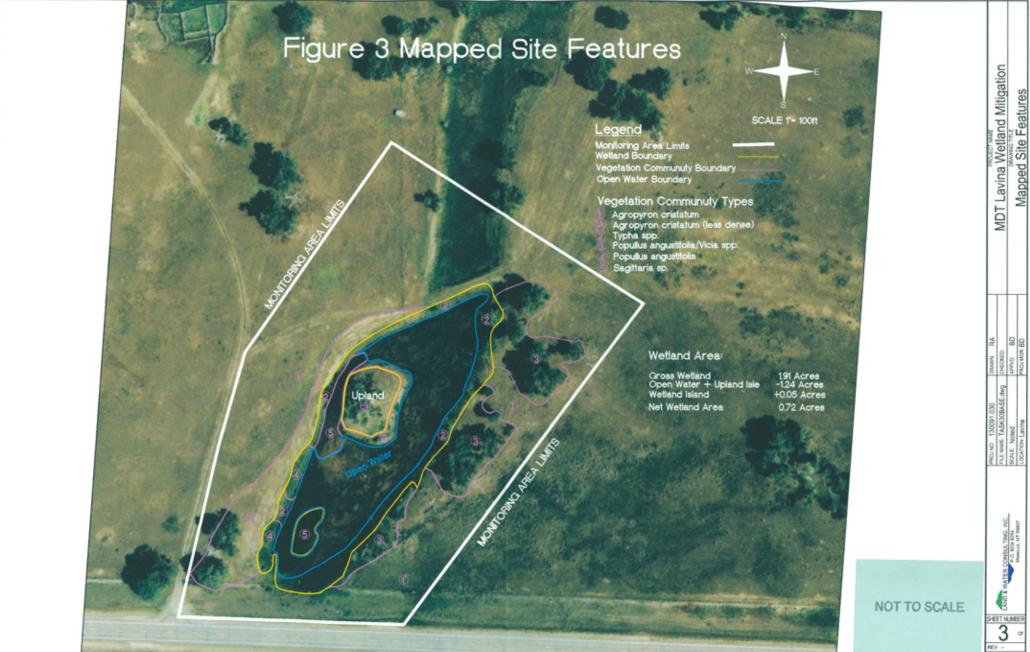
FIGURES 2 - 3

MDT Wetland Mitigation Monitoring Lavina Wetland Lavina, Montana





Monitoring Activity Locations



Appendix B

COMPLETED 2001 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2001 BIRD SURVEY FORMS
COMPLETED 2001 WETLAND DELINEATION FORMS
COMPLETED 2001 FIELD AND FULL FUNCTIONAL
ASSESSMENT FORMS
COMPLETED 2001 MACROINVERTEBRATE SAMPLING
RESULTS

MDT Wetland Mitigation Monitoring Lavina Wetland Lavina, Montana





DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM DSC- 30/June 102 roject Name: Louina Project Number: 215-30 Assessment Date: 17 | Aug | C1 Location: Laving, M7 MDT District: Five Milepost: 2/2 Legal description: T GN R 20 Section 3,3,5 Time of Day: 2:00 p.m. Weather Conditions: Cloudy, 80° Person(s) conducting the assessment: Le Caire 188 Visit #: / Monitoring Year: 200/ Initial Evaluation Date: / Size of evaluation area: 3 acres Land use surrounding wetland: Rongeland HYDROLOGY Surface Water Inundation: Present / Absent Average depths: 2 ft Range of depths: 0 - 2 ft Assessment area under inundation: 70 % Depth at emergent vegetation-open water boundary: () ft If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes V No_____ Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Drift lines suggest water was about 1' earlier in seoson Groundwater Monitoring wells: Present Absent Record depth of water below ground surface Well # Depth Well# Depth Well# Depth Additional Activities Checklist: V Map emergent vegetation-open water boundary on air photo Dbserve extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.) GPS survey groundwater monitoring wells locations if present COMMENTS/PROBLEMS: Emergent wegention Open water boundary follows the edge of

VEGETATION COMMUNITIES

Community No.: _ / Community Title	(main species): <u>Cre</u>	sted Wheat gross	2
Dominant Species	% Cover	Dominant Species	% Cover
Crested Wheat gross Kamarian	5	Dominant Species	76 Cover
Crested wheat gross / Agropyion	713230m 3		
Kochia SPP.			
Populus anoustifelia	3		
Sweet clover	12		
COMMENTS/PROBLEMS: 1A	steeperslope conernote	s w/same species as s danse. UPL	1 but
Community No.: 2 Community Title	(main species):	ypha spp.	
Dominant Species	% Cover	Dominant Species	% Cover
Typho Spp.	5		
Scirpus votides	3		
Cirsium arvense	3		
Juncus spp.	2		
COMMENTS/PROBLEMS: Community No.: 3 Community Title	e (main species): PO	g _N	
Dominant Species	19/ Cover	Dominant Species	% Cover
Populus angustifolia	% Cover	Dominan Species	70 COVE
Vicio spp.	3		
Salix spp.	ž l		
Circium arvense	2		
CH SIVE SEVENSE			
COMMENTS/PROBLEMS:			
Additional Activities Checklist:Record and map vegetative comm	nunities on air photo		

VEG	ETATION C	COMMUNITIES	LAND & WATER B-3	
Community No.: 4 Community Title (m	ain species):_	Populus ang	ustifolia (Se	plings)
			·	
		Donna	ant operies	70 COVCI
· OAX	1/00/0			
Community No.: 4 Community Title (main species): Populus argustifolia Caplings) Dominant Species % Cover Dominant Species % Cover POAN 100% COMMENTS/PROBLEMS: Cood Cover coming up here w/3-4' tall Replings % Cover Dominant Species % Cover Dominant Species % Cover Dominant Species % Cover Sagiflacia sp. (OBL) 80% COMMENTS/PROBLEMS: Open under shallow. Community No.: Community Title (main species): Community No.: Community No.: Community Title (main species): Community No.: Community No.: Community No.: Community No.: Cover Dominant Species (main species): Community No.: Cover Dominant Species (main speci				
COMMENTS/PROBLEMS: Cood Cover coming up here w/3-4' tell soplings: Community No.: 5 Community Title (main species): Accounted -wt Dominant Species % Cover Dominant Species % Cover Sagi Haria sp. (OBL) 80% COMMENTS/PROBLEMS: Open inter, Shallow. Community No.: Community Title (main species):				
COMMENTS/PROBLEMS: Coo	d Cover	coming up	here w/ 3-	-4' tall
Community No.: 5 Community Title (m	ain species):_	Arrowhead	-WL	
Dominant Species	% Cover	Domina	ant Species	% Cover
Sagiffaria sp. (OBL)				
0 , 1				
-				
COMMENTS/PROBLEMS: Open	unter,	shallow.		
Community No.: Community Title (m	ain species):_			
Dominant Species	% Cover	Domina	ant Species	% Cover
•				
COMMENTS/PROBLEMS:				
Additional Activities Checklist:Record and map vegetative communit	ies on air phot	to		
670				



MDT WETLA	ND MONITO	RING – VEGETATION TRANSECT	
Site: Lavina Date:	6.30-6	DZ Examiner: DSC Transect# /	
Approx. transect length: 50'			
			Annual coloridates
Vegetation type 1: B-17 Crested who Length of transect in this type:	decrass feet	Vegetation type 2: 17-25 Length of transect in this type: Typha spp.	feet
Species:	Cover:		Cover:
	777	Tucha Spo.	<i>5</i> 0 ·
Agraparon cristadum	30	Typha spp. Scirpus valides Circium arvense	30
Sweet clover	20	Circium ornense	20
		Juneus spp.	10
			-
Total Vegetative Cover:	90	Total Vegetative Cover:	///
Vegetation type 3: 25-5()	- I G4	Vegetation type 4:	- C .
Length of transect in this type: Species:	feet Cover:	Length of transect in this type: Species:	feet Cover:
Open water-Shellow	NA	Species.	Cover.
Chen acces sherion			
Total Vegetative Cover:	NA	Total Vegetative Cover:	

MDT WETLAND MONITORING - VEGETATION TRANSECT (back of form)



Cover Estin	ate	Indicator Class:	Source:
+=<1%	3 = 11-20%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	 - = Facultative/Wet 	V = Volunteer
2 = 6-10%	5 = >50%	0 = Facultative	

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 food depth (in open water), or at a point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 ft wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

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Spot	than 1	the location	Originala	marker	on figure C-	
	•					

COMPREHENSIVE VEGETATION LIST

LAND & WATER B-6

Carrier .			
Species	Vegetation	Species	Vegetation
1	Community		Community
	Number(s)		Number(s)
Agropy van cristatum			
Agroburon Smithii	7		
Fortid Spp.	1		
sweet clover (meof	1.3		
sweet clover (MEOF	1 . 2		
Tupho SOD.	2		
Scirpus unlides	2		
Scirpus valides Civsium orvense	2,3		
Trincus SPD	7		
Juncus SPP. Vicia SPP. Soliy SPP.	2		
Caliv cas	3.2.		
3011 3,00	3,6	to the second se	
6-30-07 Condid			
6,20-05 600			
Son Mad (W. L. O.			
Scalet (Incomaliano		1.5.	
Russia. Oline	1 /2 /	(2)	
Henderheard	2	Senens 10 10 Cloh Wide	
Hordown jubatum	~		
Entir C Word	-		
Sagisteria spp.	5		
Si Ener 32 32"			
Bindus dimar. Clar	3)		
7			
Houndstoning	14		
of Scaled Kungused	16		
1 1			

COMMENTS/PROBLEMS: Sile has reach shallows (<1') open water

Very ince we thank site un/good hadron.

All ducks in low.

Sile has reach shall we thank site un/good hadron.

Yellow Sile we thank site un/good hadron.

Yellow Sile to the standard of the SE area

* Pillod 3 plants near box in SLU corner. Appears to have been



PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed	Mortality Causes
	1 Miller		
1/1			
/// //			
7071			
			'
		<u> </u>	l
COMMENTS/PROBLEMS:			

WILDLIFE

Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating	5	pecies	Number Observed	Nesting or Breeding Activity	Likely Breedin Residen	g Migrating
rilldeev	5		1/		1			nanny	Residen	"
deducing Blockb	W 7		1/		7				<u> </u>	
edtail hank	1		1/							
ree swallows										
									<u> </u>	
		-			1				 	
					1					
					1					
					1					
				· · · · · · · · · · · · · · · · · · ·						
					1					
					1			i- 0.		
Α,					1			1 - 4.		
					1					
					1					
					1					
					1					
										1
Vere man made ructures being	nesting st	ructures i	nstalled?	Yes_// Do the	NoTy	/pe: H	Iow many	y?5 'es]	Are th	he nesting
Vere man made tructures being					NoTynesting struc		How many repairs? Y	y?5 'es1	Are the No_	he nesting
Vere man made ructures being	nesting st utilized?				AND HERF	TILES	Indirect	ndication	of use	
					AND HERF Number Observed		Indirect	ndication	of use	Other
					AND HERF	TILES	Indirect	ndication	of use	Other 5001
EVOGS Brakv					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other
					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5001
EVOGS Brakv					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5001
FVOGS Brakv					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5000
FVOGS Brakk					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5000
FVOGS Brakk					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5001
FVOGS Brakk					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5001
FVOGS Brakk					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5001
FVOGS Brakk					AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5001
FVOGS Brakk	Species Che	es es	MAM	MALS	AND HERF Number Observed	TILES	Indirect	ndication	of use	Other 5000

points liste each site ea	PHOTOGRAPHS mera with a 50 mm lenses and color film take photographs of the following ped in the checklist below. Record the direction of the photograph using a comstablish a permanent reference point by setting a ½ inch rebar or fencepost exerce the location with a resource grade GPS and mark the location on the air process.	permanent reference pass. (The first time at tending 2-3' above
At upl	e photo for each of the 4 cardinal directions surrounding wetland least one photo showing upland use surrounding wetland – if more than one and use exists, take additional photos least one photo showing buffer surrounding wetland e photo from each end of vegetation transect showing transect	
Location	Photo Photograph Description Frame #	Compass Reading
A	Let 22 wetland view	W
В	45218 Survounding Volared	F
C	16 10 Wetland buffey	147 N
D	Mage Welland View	3
E	1800 Wetland VICW	Ē
F	180K Wetland Vicw	11
G	19A Begin transect	
H	184 End transact	
	NTS/PROBLEMS: Frames 12/13 ove of the visces heginning to food. France 11 is soil	1 por column
	Canera malhi	nctri -
	photos reb	hon -
	but not a	ch sp

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points with the GPS unit set at 5 second recording rate. Record file numbers fore site in designated GPS field notebook
Jurisdictional wetland boundary 4-6 landmarks recognizable on the air photo Start and end points of vegetation transect(s) Photo reference points Groundwater monitoring well locations
COMMENTS/PROBLEMS:

Lavina -B

At each site conduct the items on the checklist below: Delineate wetlands according to the 1987 Army Corps manual. Delineate wetland-upland boundary on the air photo Survey wetland-upland boundary with a resource grade GPS survey
COMMENTS/PROBLEMS: It is definite to in no the to occurately of you on wellowed upland to proceed on the small scale
FUNCTIONAL ASSESSMENT Complete Jeff's abbreviated MDT Function and Values Assessment field form.
Were man-made nesting structures installed at this site? YES / NO If yes, do they need to be repaired? YES NO If yes, describe problems below and indicate if any actions were taken to remedy the problems.
Were man-made structures build or installed to impound water or control water flow into or out of the wetland? YESNO If yes, are the structures working properly and in good working order? YESNO If no, describe the problems below.
COMMENTS/PROBLEMS: Bird boxes GPS ed as BE-3,4 +5 Ore occupied by untreux fords BB-1+2 are not occupied. BB-1+2 are wood duck boxes. BB-3, y to ore Bluebird boxes



DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: Lavina Applicant/Owner: NDT Investigator: LeCoin, Wetlands L	Nest, Inc.	Date: 13 Aug 2001 County: Golden Valley State: MT
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situal Is the area a potential Problem Area? (If needed, explain on reverse.)	tion)? Yes No Yes No	Community ID: Tupha Transect ID: W-2 Plot ID: Sp-4
VEGETATION		
Dominant Plant Species 1. Typho SPP. H Obl 2. SCVA H Obl 3. Tuncus SPP. H Obl 4. CIAR H FACU 5. 6. 7. 8. Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). Remarks: Welland Vegetation IS defined fringe aroun	9	
HYDROLOGY		
Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available Field Observations: Depth of Surface Water: Depth to Free Water in Pit: Depth to Saturated Soil:	Water Mark Drift Lines Sediment D Dreinage Pa Secondary Indicators Oxidized Ro Water-Stain Local Soil S FAC-Neutra	n Upper 12 Inches deposits externs in Wetlands (2 or more required): not Channels in Upper 12 Inches nod Lesves Gurvey Data
Remarks:	,	



SOILS

Map Unit Name (Series and Phase): Silvery 201 rom Taxonomy (Subgroup):	Dreinage Class: Field Observations Confirm Mapped Type? Yes No						
Profile Description: Depth Matrix Color (Munsell Moist) C-18 A D V R /							
Hydric Soil Indicators: Histosol							
WETLAND DETERMINATION Hydrophytic Vegetation Present? (Circle	(Circle)						
Wetland Hydrology Present? (762) No Hydric Soils Present? (769) No	Is this Sampling Point Within a Wetland? Yes No						
Remarks: A constructed dep	pressional we tland.						

B-19

Approved by HQUSACE 3/92



DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: Lavina Applicant/Owner: MDT Investigator: helain, Wellands	West, Inc.	Date: 3 Aug 2001 County: 6-666-7 Valley State: NT
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situat Is the area a potential Problem Area? (If needed, explain on reverse.)	ion)? Yes No Yes No	Community ID: AGCR Transect ID: UP-2 Plot ID: 5P43
VEGETATION		
Dominant Plant Species 1. AGCR H - 2. AGST H FACU 3. POAN T FACW 4. ARTR 5 6. 7. 8. Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). Remarks: Upland Site	9	Stratum Indicator
HYDROLOGY		
Recorded Data (Describe in Remarks): Stream, Lake, or Tide Gauge Aerial Photographs Other No Recorded Data Available Field Observations: Depth of Surface Water: Depth to Free Water in Pit: Depth to Saturated Soil: Remarks: No evidence of we	Water Mai Drift Lines Sediment Drainage F Secondary Indicators Oxidized R Water-Stai Local Soil FAC-Neutr Other (Exp	in Upper 12 Inches rks Deposits Patterns in Wedlands s (2 or more required): Root Channels in Upper 12 Inches ined Leaves Survey Data rai Test blain in Remarks)
TO Evidence of We	(10416 nyovi	, , , , , , , , , , , , , , , , , , ,



SOILS

Map Unit Name (Series and Phase):	· ·	complete	Drainage (Field Obse Confirm	
Profile Description: Depth (inches) Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
Reducin Gleyed	pipedon Odor Joisture Regime g Conditions or Low-Chroma Color	- Hi	rganic Streaking in Sands sted on Local Hydric Soil sted on National Hydric S ther (Explain in Remarks)	s List Soils List
Remarks: Soi/ 171	motrix of	ot dug. Sandy K	Impenet an	rable cobbles

WETLAND DETERMINATION

	c Vegetation F ydrology Prese s Present?		Yes No (Circle) Yes No		nt Within a Wetland?	(Circle) Yes Ng
Remarks:	Area	is	semi-avid	rangeland		
	-7-				Approved by HOUS	105400

B-19

Lavina

Does AA offer strong potential for use as recreation / education site? Y



rm

	Draft Field	Data Collection	Sheet for	MDT I	Montana	Wetland.	Assessment	For
. CLASSIFIC	ATION							
Author Proceedings of the Control of	and the state of t	The state of the s						

	Estimated % of AA	Server and a	Predominant Water Reg	ime (CIRCLE) 🤲
Emergent	20%]	PF IE SPF SF S	TF IF
Aquatic Bed	50%	(1	PF IE SPF SF S	TF IF
Moss-Lichen	-	1	PF IE SPF SF S	TF IF
Scrub-Shrub	20%		PF IE SPF /SF S	TF) IF
Forested	10%	1	PF IE SPF SF S	TF) IF
Total Estimated % Vegetated	100 %0	4	nerve in the contract of the contract of	Terror Section 1
DISTURBANCE is: High Mode	rate Low Constructed we	tland, x	porecent of	listurbone
On wetlands on site pond or flood? Y Ones AA contain surface or subsurface outlet?	N (if no, skip to groundwater discharge Y N If outlet present, is		on of this section)	yes")(XY) N
Longest duration of surface water:	on Clader a salada ya kifani	Surface Wa	ter Duration and other	attributes (circle)
at any wetlands within AA		Rerm / Perer	Seas / Intermit	Temp / Ephem
in at least 10% of AA (both wetlands and non	wetlands [deepwater, streambed]	Perm / Perer	Seas / Intermit	Temp / Ephem
where fish are or historically were present (cre	oss out if not applicable)	-Perm / Perer	Seas / Intermit	Temp / Ephem
% of waterbody containing cov	er objects	>25%	(0-25%)	<10%
% bank or shore with riparian of	or wetland shrub or forested communities	>75%	50-74%	<50%
adjacent to rooted wetland vegetation along a to wave action (cross out if not applicable)	defined watercourse or shoreline subject	Perm / Perer	Seas / Intermit	Temp/Ephem
- V+0F418002+009/T-0	ore by sp. with binding rootmasses	>65%	35-64%	<35%
% cover of wetland bank or sho				
% cover of wetland bank or sho Do any wetlands on site flood as a result of in-c Estimated wetland area subject to per Estimated % of flooded wetland class Evidence of groundwater discharge or recharge I. VERTEBRATES Evidence of or potential for T&E or MNHP specific per I. VELY N. Leopard	riodic flooding (acres): ≥10 2-10 sified SS, FO or both: ≥75 Y N List: Rest	25-74 Victed	outlet yes-un10	
Do any wetlands on site flood as a result of in-c Estimated wetland area subject to per Estimated % of flooded wetland class Evidence of groundwater discharge or recharge I. VERTEBRATES	riodic flooding (acres): ≥10 2-10 sified SS, FO or both: ≥75 ?? Y N List: Rest ecies use? (For general wildlife use, see separate see the second se	25-74 Victed	outlet	
Do any wetlands on site flood as a result of in-c Estimated wetland area subject to per Estimated % of flooded wetland class Evidence of groundwater discharge or recharge I. VERTEBRATES Evidence of or potential for T&E or MNHP spending of the company of the com	riodic flooding (acres): ≥10 2-10 sified SS, FO or both: ≥75 ?? Y N List: Rest ecies use? (For general wildlife use, see separate see the second se	25-74 Victed	outlet	
Do any wetlands on site flood as a result of in-c Estimated wetland area subject to per Estimated % of flooded wetland class Evidence of groundwater discharge or recharge I. VERTEBRATES Evidence of or potential for T&E or MNHP specifically I. Leopard Fish observations?	riodic flooding (acres): ≥10 2-10 sified SS, FO or both: ≥75 ?? Y N List: Rest ecies use? (For general wildlife use, see separation of the second s	25-74 Vic fed arate form.)	outlet	frogs-

N)Type:

Evaluation Date: Mo. Day 2	3Yr. 024.E	valuator	(s):	P. Jeso	5. We	tlands/Site	#(s)		
i. Wetland Location(s): I, Legal: T									
III. Watershed:	201 GPS	S Referen	nce No. (If applies):					
b. Purpose of Evaluation: 1Wellands potentially affected wellands; pre-conditions and Mitigation wellands; post-conditions well-and we	d by MDT project	9. /	Assessn	size: (total a nent area: (A ions on deter	VA, tot., ac.,	(visu (mea	ally estimated) sured, e.g. by GP (visually estin (measured, e	nated)	
10. Classification of Wetland and Aq	uatic Habitats i	n AA (HG	M accon	ding to Brinse	on, first col.; USF	WS accordi	ng to Cowardin [1	979], remainir	ng cols.)
	stem		Subsy			Class	Water Regime	Modifier	% of A
Riverine P	alustri	n.e		NA		EM	Н	E	810
`	`	"		NA		AB	C	E	10
T	alustr	ine		NA		SS	В	E	10
ornitionity Exposed (G), Semipermanently Flood), Partly Drained (PD), Farmed (F), Anticial (A)	s), Forested Wetland erennial (2)/ Classes: led (F), Seasonally Fi HGM Classes: Riven	(FO)/ Syste : RB, UB, AB boded (C), S ne, Depress	em: Lacust B, US, EM/ Saturated (E sional, Siop	rine (LV, Subsys Subsystem: Up; 3), Temporarity Fi e, Mineral Soil Fi	it.; Limmetic (2)/ Class per Perennial (3)/ Class looded (A), Intermitteni lats, Organic Soil Flats	es: RB, UB, AS sses: RB, UB, / By Flooded (J) s, Lacustrine Fr	Modifiers: Excavated inge	(4)/ Classes: RE	B, UB, AB, Flooded (H
1. Estimated relative abundance: (of (Circle one) Comments: Com	s), Forested Wettand erennial (2)/ Classes ed (F), Seasonally FI HGM Classes: Riven similarly classifi n	(FOV System Report of Control of	em: Lacust 8, US, EM/ inturated (B inonal, Stop within the re	subsystem: Up; s), Temporarity Fi e, Mineral Soil Fi same Major I	nt: timebic (2) Classon of Perennial (3) Common of Perennial (3) Common of Perennial (3) Common of Perennial (3) Common	es: RB, UB, AS sses: RB, UB, A dy Flooded (J) , Lacustrine Fr ed Basin, so	St Subsystem: Littoral RB, US/ Water Regim Modifiers: Excavated inge ee definitions) Abunda	(4)/ Classes; RE es: Permanently (E), Impounded), UB, AB, Flooded (H
1. Estimated relative abundance: (of (Circle one) Unknown	s), Forested Wettand erennial (2)/ Classes ed (F), Seasonally FI HGM Classes: Riven similarly classifi n	(FOV System Report of Control of	em: Lacust 8, US, EM/ inturated (B inonal, Stop within the re	propriate res	nt: timebic (2) Class pet Perennial (3) Class pet Perennial (3) Class looded (A), Intermitten lats, Organic Soil Flats Montana Watersh Common Common	es: RB, UB, At sees: RB, UB, A by Flooded (J) , Lacustrine Fr ed Basin, so	Styleystem: Littoral NB, US/ Water Regim Modifiers: Excavated inge ee definitions) Abunda	(4) Classes: RE es: Permanently (E), Impounded	B, UB, AB, Flooded (H)
1. Estimated relative abundance: (of (Circle one) Unknown Comments: 2. General condition of AA: I. Regarding disturbance: (use no Conditions within AA	s), Forested Wettand orennial (2) Classes ed (F), Seasonally FIHGM Classes: River similarly classified the control of the cont	(FOV Systems (FOV	em: Lacusta s, US, EM/ s, US, EM/ sithirated (E sional, Stop within the re circle] ap naged in pm ste; is not g otherwise	subsystem: Up; s), Temporarity Fi e, Mineral Soil Fi same Major I spropriate res Predomit edominantly razed, hayed,	nt: timebic (2) Class pet Perennial (3) Class pet Perennial (3) Class looded (A), Intermitten lats, Organic Soil Flats Montana Watersh Common Common	es: RB, UB, AB sses: RB, UB, AB ty Flooded (J) ty Flooded (J) ed Basin, so ed Basin, so but moderatel selectively logs to minor clear	Styleystem: Littoral RB, US/ Water Regim Modifiers: Excavated inge ee definitions) Abunda within 500 feet of) Land cultivated subject to subs	(4) Classes: RE es: Permanently (E), Impounded Int AA d or heavily graze standat fill placent drological afterabil	d or logged ent, gradin,
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A occurs and is managed in predominantly naturalized, hayed, logged, or otherwise converted, does aged, no hayed of heavily grazed or hayed aged, or hydrological alteration; contacts the cultivated, but moderately grazed or hayed aged, or hydrological alteration; contacts the cultivated but moderately grazed or hayed aged, or hydrological alteration; contacts the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged.	s), Forested Wettand erennial (2)/ Classes ed (F), Seasonally FI HGM Classes: Riven similarly classifi Sugs - Comm natrix below to de el stale, is not as not contain or selectively ining, fill roads or buildings o relatively	(FO) Systems (FO)	arr. Lacusta, U.S. EM/ inturated (E inturate	subsystem: Up; Subsystem: Up; Subsystem: Up; Mineral Soil Fi same Major I same Major I spropriate resippropriate resippropriat	tt: Limebo (2) Classon Perennial (3) Classon Perennial (3) Classon Perennial (3) Classon Perennial (3) Classon Perennial Common Common Common Perennial Common	es: RB, UB, AI sses: RB, UB, AI sses: RB, UB, V proceed (J) Lacustrine Fr ed Basin, so ed Basin, so ed Basin, so lipacent to (v but moderatel selectively logg tor buildings	AS Subsystem: Littoral AB, US/ Water Regim Modifiers: Excavated inge ee definitions) Abunda A	(A) Classes; REes; Permanently (E), Impounded of the control of th	B, UB, AB, Flooded (H (I)). Diked d or logged nent, gradin
A occurs and is managed in predominantly naturalized, hayed, logged, or otherwise converted, does aged, no hayed of heavily grazed or hayed aged, or hydrological alteration; contacts the cultivated, but moderately grazed or hayed aged, or hydrological alteration; contacts the cultivated but moderately grazed or hayed aged, or hydrological alteration; contacts the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged, subject to the cultivated or heavily grazed or logged.	s), Forested Wettand orennial (2)/ Classes ed (F), Seasonally FI HGM Classes: Riven similarly classifi Sugger Community matrix below to de si state, is not us not contain or selectively uring, fill roads or buildings o relatively rological alteration; , intensity, seaso	(FOV Systems (FOV Systems (FOV Systems (FO)	arr. Lacusta, S. U.S. EM. I intuitive de la circle] apprinte la circle] apprinte la circle] apprinte la circle] apprinte la contain roaciumbance la disturbance	subsystem: Up; Subsystem: Up; J. Temporarity F e. Mineral Soil F same Major I propriate res Predomin edominantly razed, hayed, converted; ss or buildings.	it: timebic (2) Classon of Perennial (3) Classon of Perennial (3) Classon of Perennial (3) Classon of Perennials, Organic Soil Flats Montana Watersh Common Common Lead not cultivated, grased or hayed or or has been subject contains few roads low disturbance moderate disturbance	es: RB, UB, At sees: RB	Subsystem: Littoral NB, US/ Water Regim Modifiers: Excavated inge ee definitions) Abunda Abun	(A) Classes; REes; Permanently (E), Impounded of the control of th	B, UB, AB, Flooded (H (I). Diked d or loggedent, gradin
A occurs and is managed in predominantly natura reazed, hayed, logged, or otherwise converted, does also or occupied buildings A not cutilivated, but moderately grazed or hayed, also must be subject to relatively minor cleatacement, or hydrological alteration; centains few. A cuttivated or heavily grazed or logged, or hydrological alteration; centains few. A cuttivated or heavily grazed or logged, subject to ubstantial full placement, grading, cleaning, or hydrological siteration; centains few. A cuttivated or heavily grazed or logged, subject to ubstantial full placement, grading, cleaning, or hydrological siteration. Confirm for hydrological siteration contains few. A cuttivated or heavily grazed or logged, subject to ubstantial full placement, grading, cleaning, or hydrological siteration. Comments: (types of disturbance,	s), Forested Wettand orennial (2)/ Classes end (F), Seasonally FIHGM Classes: River similarly classified (F), Seasonally FIHGM Classes: River similarly classified (F), CD matrix below to de si state, is not so to contain or selectively uring, full roads or buildings or relatively rological alteration; intensity, season oduced specie	(FOV Systems (FOV Systems (FOV Systems (FO)	am Lacusta am Lacusta as U.S. EM/ inturated (B innel, Siop ifthin the re circle] ap maged in pn mage	subsystem: Up; Subsystem: Up; Subsystem: Up; Mineral Soil Fi same Major I same Major I spropriate res Predomin edominantly razed, hayed, converted; so or buildings.	incitination (2) Classo of Perennial (3) Classo of Perennial (3) Classo occupants (4) Intermittentials, Organic Soil Flats Montana Watersh Common Common Lead not cultivated, grated or hayed or or has been subject contains few roads low disturbance moderate disturbance of the contains few roads of the contains few roads or hayed or or has been subject contains few roads or hayed or or has been subject contains few roads or hayed or or has been subject contains few roads or hayed or or has been subject contains few roads or hayed or or has been subject.	es: RB, UB, At sees: RB	Subsystem: Littoral NB, US/ Water Regim Modifiers: Excavated inge ee definitions) Abunda Abun	(4) Classes: RE es: Permanently (E), Impounded nt AA d or heavily graze standa! fill placent drological alterabilistic sturbance bance bance	d or logged ent, gradin on; high rea
Comments: 2. General condition of AA: 1. Regarding disturbance: (use in Conditions within AA A occurs and is managed in predominantly natural razed, hayed, logged, or otherwise converted, does leads or occupied buildings. A not cultivated, but moderately grazed or hayed or logged, or has been subject to relatively minor cleal accement, or hydrological attention; contains few. A cultivated or heavily grazed or logged, subject to ubstantial full glacement, grading, cleaning, or hydrigh road or building density. Comments: (types of disturbance, it. Prominent weedy, allien, & introduced.)	s), Forested Wettand erennial (2)/ Classes erennial (2)/ Classes ed (F), Seasonally Filled Classes: River similarly classified Classes of the Contain or selectively uring, full roads or buildings or relatively rological alteration; intensity, season roduced species marry of AA and and classes of the Contain of AA and classes of the Contain	(FO) Systems (FO)	am Lacusta am Lacusta a, US, EM/ inturated (B innel, Siop ifthin the re circle] ap maged in pn maged	subsystem: Up) Subsystem: Up) Subsystem: Up) Same Major I same Major I same Major I propriate res Predomin edominantly razed, hayed, converted; so or buildings. pance e not domes and use/habit	it: timebic (2) Classo pet Perennial (3) Classo pet Perennial (3) Classo pet Perennial (3) Classo pet Perennial (3) Classo pet P	es: RB, UB, At, sees: RB, UB, Atgresses: RB, UB, At	Subsystem: Littoral NB, US/ Water Regim Medifiers: Excavated inge ee definitions) Abunda Abun	AA or heavily graze tanta! fill placent development sturbance pance	d or logged ent, gradin on; high rea
A occurs and is managed in predominantly naturalized, hayed, logged, or otherwise convenies, does not competed buildings. A occurs and is managed in predominantly naturalized, hayed, logged, or otherwise convenies, does not occupied buildings. A not cuttivated, but moderately grazed or hayed of logged, or has been subject to relatively minor clear lacement, or hydrological atteration; contains few the stantial full placement, grading, cleaning, or hydrogh road or building density. Comments: (types of disturbance, it. Prominent weedy, allien, & Intri-	erennial (2) Classes erennial (2) Classes ed (F). Seasonally Filled Classes: River of the Classes: River of th	(FO) Systems (FO)	am Lacusta am Lacusta a, US, EM/ inturated (B innel, Siop ifthin the re circle] ap maged in pn maged	ses present Subsystem: Up; Subsystem: Up; Subsystem: Up; Mineral Soil F Same Major I Same Major I Predomin edominantly razed, hayed, convened; so or buildings.	in timebic (2) Classo per Perennial (3) Common Commo	es: RB, UB, At sess: RB, UB, At the session of t	As useystem: Littoral NB, US/ Water Regim Modifiers: Excavated inge see definitions) Abunda A	AA or heavily graze tanta! fill placent development sturbance pance	d or logger end, gradie



SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally	Listed	or Pr	oposed	1 Th	reatene	d or E	ndange	ered	Plants	or Ani	lmals:									
AA is Documented (D)	or Sus	pecte	d (S) to			le one	based o	on d	efinition	conta	ained in	instr	uctions)	1						
Primary or critical habit			es)		DS															
Secondary habitat (list					DS															
Incidental habitat (list : No usable habitat	specie	5)			D S															
rvo usable nabijat					D S	-														
II. Rating (use the conclus this function)	sions fro	om i at	oove and	d the	e matrix I	below	to arrive	at [circle) th	e func	tional po	oints	and rat	ing (H =	high, l	M = 1	moderat	te, or L	= low) 1	or
Highest Habital Level		doc./p	rimary		sus/prin	nary	doc	sec	ondary	sus	./secon	dary	doc	./incide	ental	sus	Jincider	ntal	Non	e
Functional Points and Rat	ling	1 (H)		1	.9 (H)		.8 (N	r)		.7(M)		.5(L) .		.3 (1	L)		O(L)	7
Sources for documented us	e (e.g.	observ	rations,):	13			1	,		1.01	-/		10 (C.	1
14B. Habitat for plant or a	nimals	rated	S1, S2	, or	S3 by t	he Mo	ntana I	Vatu	ral Her	tage P	rooran	o: (p	of includ	ling spe	ories lis	ted i	n14A a	hove)		
 AA is Documented (D) 	or Sus	pecte	d (S) to	conf	tain (circ	le nne	hacad r	on d	e finition	conto	inad in	inetn	untionel	-						
Primary or critical habit	tat (list	speci	es)		D(S)	٨	Jile	ðV.	pard	An	095 -	7 b	0514	ve 1	Din	Pu	jegar	κw	L)	
Secondary habitat (list					DŠ			-		-	1	4					, ,			
Incidental habitat (fist :	specie	s)			D S															
No usable habitat					D S	_														
II Pating (upo the constru	.: f	!																		
 Rating (use the conclus this function) 	sions th	omia	oove and	o tne	e matnx	pelow	to arrive	at [circle) th	e func	tional po	oints	and rati	ng [H =	high, I	M = 1	moderat	te, or L	= low] f	or
ans roncastry				-						1									1	
Highest Habitat Level	-	doc./p	rimary	_	sus/prin	nary	doc.	sec	ondary	sus	/secon	dary	doc	./incide	ental	sus.	/incider	ntal	None	e
Functional Points and Rat	ting	1 (H)		1/	.B (H)	/	.7 (N	1)		.60	M)		.2(L		.1 (1	_)		Our	1
Sources for documented us	e (e.g.	obsen	rations,	reco	rds, e.c.):	1 3 1/2	-		1.01	,		1_1_1				,		7	-
14C, General Wildlife Hat	oltat Ra	ating:																		
i. Evidence of overall wild	dille us	se in ti	DE AA (circ	e substa	ntial, r	moderati	e, or	low bas	ed on	support	ing e	widence	:):						
Substantial (based on any	of the	followi	na Icher	cki):							Low	/haer	od on ar	ny of the	a followi	ina t	check]):			
observations of abunda	ant wild	life#s	or high	SDE	ecies div	ersity	durino a	anv r	period)								ning pea		periods	
abundant wilding sign :	such as	sscat	tracks.	nes	t structu	res or	ame trail	c et	·		litt	le to	no wildi	ife sign			•			
presence of extremely interviews with local bid	limiting closists	habita	at featur	es n	ot availa	ble in	the sum	ounc	ding area	3	sp	arse	adjacer	it uplan	d food	sour	ces		(4b. AA	
Interviews with rocal bit	ulugisis	WILL P	(I IOWIEO)	ge o	I DIE AM						int	ervie	ws with	local D	iologist	s witi	h knowk	eage o	the AA	4
Moderate (based on any of	f the fol	llowing	[check	D:																
observations of scatter	ed wild	life gro	oups or	indiv	iduals o	r relati	vely few	spe	cies du	ing pe	ak perio	ds								
common occurrence of adequate adjacent uplating interviews with local bid	n wildin	e sign	such as	SC	at, tracks	, nest	structur	es,	game tr	ails, etc	Э.									
interviews with local bid	ologists	with k	conwed	ne n	f the AA															
				gee	, incres															
II. Wildlife habitat features	s (worki	ing fro	m top to	bot	tom, circ	le app	ropriate	AΑ	attribute	s in m	atrix to a	arrive	at exce	entional	(E), his	ah (H	f), mode	erate (N	A), or lo	w
(L) rating. Structural divers	ity is tr	om #1	For a	class	s cover to	o be o	onsidere	ed ev	veniv dis	tribute	d. vecet	ated	classes	must l	be withi	in 20	% of ea	ch othe	er in ten	ms
or their percent composition	or the	AA (se	e #10).	Ab	breviatio	ns for	surface	wat	er durat	ons an	e as foll	OWS:	P/P = t	erman	ent/pen	ennia	al; S/1 =			
seasonal/intermittent; T/E =	tempo	rary/ep	hemera	ıl, ar	nd A`≂ at	sent [see inst	ructi	ions for	further	definition	ons c	of these	terms).)					
Structural diversity (see			-	Hi	gh						1	Mode	erate			- 1		Lov	٧	
#13) Class cover distribution		F				Long.	-				· ·									
(all vegetated classes)		Eve	n		(Unev	ren`			Eve	n.			Unev	en	- 1		Eve	n	
Duration of surface	P/P	S/I	T/E	Δ.	DW	Ca	7.5		DIE		7/5		- D/D	6, 1	7.5		D.D.	C/I	7.0"	1
water in ≥ 10% of AA	111	3/1	1/6	Α	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	^	P/P	S/I	T/E	A
Low disturbance at AA	E	E	E	н	E	E	н	н	E	н	н	М	E	н	м	M	E	н	M	M
(see #12i)	-	_	-	"	-	-	"	"	٠ ـ	n		m	-	"	140	"	-	,"	141	
Moderate disturbance	н	Н	н	Н	(H)	Н	н	М	н	н	M	М	н	M	м	1	н	M	L	L

III.	Rating (use the conclusions from I and II above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M =
mo	oderate, or L = low) for this function)

M

L М

н

M

L L

н

М

н

М

M

M

L

L

L

Н

L

М

L

L

L

L

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)									
	Exceptional	High	Moderate)	Low						
Substantial	1 (E)	.9 (H)	多(H)	.7 (M)						
Moderate	.9 (H)	.7 (M)	.5 (M)	.3 (L)						
Minimal	.6 (M)	.4 (M)	.2 (L)	.1 (L)						

Comments:

(see #12i)

at AA (see #12i) High disturbance at AA

М

M

Н

м

(H)

M L

Н

Н

М

н

L

14D. General Fish/Aquatic Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle NA here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in it below, and noted in the comments.)

Habitat Quality (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating

Duration of surface water in AA	Permanent / Perennial			Seas	onal / Intern	vittent	Temporary / Ephemeral			
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10–25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%	
Shading - >75% of streambank or shoreline within AA contains inparian or welland scrub-shrub or forested communities	Ε	E	Н	Н	Н	М	M	M	М.	
Shading – 50 to 75% of streambank or shoreline within AA contains rip, or wetland scrub-shrub or forested communities	Н	Н	М	М	М	М	М	L	L	
Shading - < 50% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	Н	М	М	М	L	.r	L	L	L	

iii. Modified Habitat Quality (Circle the appropriate response to the following question. If answer is Y, then reduce rating in I above by one level [E = H, H = M, M = L, L = L]). Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?

Y

N

Modified habitat quality rating = (circle)

E

H

M

L

III. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating (E = exceptional, H = high, M = moderate, or L = low) for this function)

Types of fish known or	Modified Habitat Quality (ii)									
suspected within AA	Exceptional	High	Moderate	Low						
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)						
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)						
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)						
No fish	.5 (M)	.3 (L)	2(L)	.1 (L)						

Comments:

14E. Flood Attenuation: (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function.)

Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Estimated wetland area in AA subject to periodic flooding		≥ 10 acres		_ <	10, >2 acre	5			
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	1(H)	.9(H)	.6(M)	.8(H)	.7(H)	.5(M)	.4(M)	.3(L)	(2(LD)
AA contains unrestricted outlet	.9(H)	.8(H)	.5(M)	.7(H)	.6(M)	.4(M)	.3(L)	.2(L)	.1(L)

II. Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA (circle)? Y Comments:

(N)

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle NA here and proceed with the evaluation.)

Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum ecre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding		>5 acre fe	et	5	5, >1 acre fe	×L/	≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	P/P S/I T/E			S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	1(H)	.9(H)	.8(H)	(8/H))	.6(M)	.5(M)	.4(M)	.3(L)	.2(L)
Wetlands in AA flood or pond < 5 out of 10 years	.9(H)	.8(H)	.7(M)	.7(M)	.5(M)	.4(M)	.3(L)	.2(L)	.1(L)

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle NA here and proceed with the evaluation.)

Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Sediment, nutrient, and toxicant input levels within AA	deliver low or comp substantial	to moderate le ounds such the y impaired. Mi s or toxicants,	ing land use wi evels of sedime nat other function nor sedimental or signs of eut esent.	nts, nutrients, ons are not ion, sources of	nutrients, or toxi use with poter nutrients, or co	r "probable caus cants or AA rece ntial to deliver hig ompounds such npaired, Major se	es" related to eives or surrou gh levels of se that other fund adimentation, s	sediment, unding land diments, ctions are sources of
% cover of wetland vegetation in AA	127	70%	<	70%	≥ 70			'0%
Evidence of flooding or ponding in AA					Yes	No	Yes	No
AA contains no or restricted outlet					.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains unrestricted outlet	97(H)	7 (M)	6 (M)	4 (14)	4 (M)	3(1)	2(L)	.1 (L)

14H Sediment/Shoreline Stabilization: (applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If does not apply, circle NA here and proceed to next function)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L | low! for this function

". Cover of wetland streambank or	Duration of surface water adjacent to rooted vegetation									
ioreline by species with deep, binding rootmasses	permanent / perennial	seasonal / intermittent	Temporary / ephemeral							
≥ 65%	(1(H))	.9 (H)	.7 (M)							
35-64%	.7 (M)	.6 (M)	.5 (M)							
< 35%	.3 (L)	.2 (L)	.1 (L)							

Comments:

14I. Production Export/Food Chain Support:

 Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or absent (see instructions for further definitions of these terms)

Α		Vegeta	ited comp	ponent >	5 acres		Vegetated component 1-5 acres					Vegetated component <1 acre						
В	Hi	gh	Mod	erate	L	OW	_/8	igh	Mod	erate	L	OW	Hi	gh	Mod	erate	Lo	w
C	Yes	No	Yes	No	Yes	No	Yes	(No)	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.9H	.9H	.8H	.8H	.7M	.9H	(H8)	H8.	.7M	.7M	.6M	.7M	.6M	.6M	.4M	.4M	.3L
S/I	.9H	H8.	.8H	.7M	.7M	.6M	H8.	.7M	.7M	.6M	.6M	.5M	.6M	.5M	.5M	.3L	.3L	.2L
T/E/	.8H	.7M	.7M	.6M	.6M	.5M	.7M	.6M	.6M	.5M	.5M	.4M	.5M	.4M	.4M	.2L	.2L	.1L
Α																		

Comments:

 Groundwater Discharge/Recharge: (Check the indicators in i		
Springs are known or observed Vegelation growing during dormant season/drought Wetland occurs at the toe of a natural slope Seeps are present at the wetland edge AA permanently flooded during drought periods Wetland contains an outlet, but no inlet		ators trate present without underlying impeding layer is inlet but no outlet
Cther i. Rating: Use the information from i and ii above and the table belo	our to arrive at faireful the	American arises and ratios (M = blob 1 = loud for this function
Criteria	w to anne at juicej the	Functional Points and Rating
AA is known Discharge/Recharge area or one or more indicators of Di	/R present	(1(H))
No Discharge/Recharge indicators present		1417

Criteria	Functional Points and Rating		
AA is known Discharge/Recharge area or one or more indicators of D/R present	(1(H))		
No Discharge/Recharge indicators present	-1-(t)		
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)		

Comments:

14K. Uniqueness:

Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MNHP		AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate			
Estimated relative abundance (#11)	rare	common	abundant	rare	6ommon) abundant	rare	common	abundant
Low disturbance at AA (#12i)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6.(M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	(.5 (M))	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: i. is the AA a known rec./ed. site: (circle) Y N. (if yes, rate as [circle] High [1] and go to ii; if no go to iii)

 Check categories that apply to the AA: ____ Educational/scientific study. _ __ Consumptive rec.; ___ Non-consumptive rec.; ___Other

 Based on the location, diversity, size, and other site attributes, is there strong potential for rec. Jed. use? Y N (If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

Iv. Rating (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	Disturbance at AA (#12i)				
	low	moderate	high		
public ownership 2	1 (H)	.5 (M)	.2(4)		
private ownership .	.7 (M)	.3 (L)	/1 (L) /		

Comments:

Function & Value Variables	Rating	Actual Functional Points	Possible Function al Points	Functional Units; (Actual Points I Estimated AA Acmage) (1.25 AC)		
A. Listeu/Proposed T&E Species Habitat	L	0	1			
B. MT Natural Heritage Program Species Habitat	4	.8	1	78		
C. General Wildlife Habitat	4	.8	1	1 22		
D. General Fish/Aquatic Habitat	ALA			remark		
E. Flood Attenuation	L	.2				
F. Short and Long Term Surface Water Storage	H	.8		7. j		
3. Sediment/Nutrient/Toxicant Removal	14					
H. Sediment/Shoreline Stabilization	14	1				
Production Export/Food Chain Support	H	.8	1	1 1,034		
J. Groundwater Discharge/Recharge	14_	1	1	1.100.00		
K. Uniqueness	m	.5	1			
Recreation/Education Potential	1	. 1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Totals:		7.0	10	12.25		
VERALL ANALYSIS AREA (AA) RATING: (Circle appr	modula catanasa h	63%	•) I II (II) IV		

Category I Wetland: (Must satisfy one of the following criteria; if does not meet criteria, go to Category II) Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or Score of 1 functional point for Uniqueness; or Score of 1 functional point for Flood Attenuation and answer to Question 14E.fi is "yes"; or Total actual functional points > 80% (round to nearest whole #) of total possible functional points. Category il Wetland: (Criteria for Category i not satisfied and meets any one of the following criteria; if not satisfied, go to Category IV) Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or Score of .0 or 1 functional point for General Wildlife Habitat; or Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or "I ligh" to "Exceptional" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or Score of .9 functional point for Uniqueness; or Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points. (Category III Wetlands Criteria for Categories I, II or IV not satisfied) Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Cetogory III) "Low" rating for Uniqueness; and "Low" rating for Production Export/Food Chain Support; and Total actual functional points < 30% (round to nearest whole #) of total possible functional points

Macro-invertebrates Sampling Results for Lavina



Wetland Mitiga	tment of Transportation tion Monitoring Project for Water Consulting	Project Name Project/task number Date Field Personnel Note	Lavinia #5 215-30 8/13/2001		
	2001	Rhithron Sample Identification	13		
Coelenterata		Hydra			
Oligochaeta	Enchytraeid:	Enchytraeidae			
		Chaetogaster	2		
		Nais elinguis			
		Nais variabilis	2		
		Ophidonais serpentina			
	Tubificidae	Tubificidae - immature			
		Limnodrilus hoffmeisteri			
Hirudinea	Erpobdellida	Mooreobdella microstoma	4		
	01 11 "1	Nephelopsis			
	Glossiphoniidae	Helobdella stagnalis			
		Helobdella			
Bivalvia	Subscriide	Glossiphonia Sphaerium			
Gastropoda	Lymnaeida	•			
оны орона	Physidae				
	Planorbidae		1		
	Tunorounc	Helisoma			
Crustacea	Cladocera	Cladocera	1		
		Calanoida	7		
		Cyclopoida			
	Ostracoda	Ostracoda			
	Amphipoda	Gammarus			
		Hyalella azteca	15		
	Decapoda	Orconectes			
Acarina		Acari			
Odonata	Aeshnidae				
	Libellulidae	Libellulidae-early instar	4		
	21 2 22	Sympetrum	2		
	Cocnagrionidae	Coenagrionidae-early instar	9		
	T	Enallagma	2		
Enhancement and	Lestidae		12		
Ephemeroptera	Caenidae	Callibaetis	12 67		
Hemiptera		Corixidae - immature	07		
пенирска	Containa	Hesperocorixa			
		Sigara			
		Trichocorixa			
	Nepidae	Ranatra			
	Notonectidae				
Trichoptera		Hydroptilidae - pupa			
		Leptoceridae - early instar	1		
		Mystacides			
		Ylodes			
Coleoptera		Chrysomelidae			
	Curculionidae				
	Dytiscidae		_		
		Hydroporinae - early instar larvae	3		
		Hygrotus	1		
		Loccophilus			
		Laccophilus			
	Elmidaa	Neoporus Heterlimnius			
	Haliplidae				
	ranpiidae	Peltodytes	2		
	Hydrophilidae	•	4		
	11, at optimate	Helophorus			
		Hydrobius			
		Hydrochara	1		
		Laccobius	-		

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Macro-invertebrates Sampling Results for Lavina

Diptera

Ceratopogonina	Bezzia/Palpomyia Dasyhelea		7
Chaoboridae	Chaoborus		
Culicidae	Anopheles		
	Culex		
Ephydridae	Ephydridae		
Simuliidae	Simulium		
Sciomyzidae	Sciomyzidae		
Stratiomyidae	Odontomyia		
Chironomidae	Acricotopus		
	Chironomus		
	Cladotanytarsus		
	Corynoneura		1
	Cryptotendipes		
	Dicrotendipes		24
	Einfeldia		
	Endochironomus		
	Labrundinia		
	Microtendipes		
	Orthocladius annectens		3
	Parachironomus		
	Paramerina		9
	Paratanytarsus		
	Phaenopsectra		
	Polypedilum		1
	Procladius		
	Psectrocladius		11
	Psectrotanypus		
	Pseudochironomus		
	Tanypus		
	Tanytarsus		19
	grids	TOTAL	202 8
	Total taxa	TOTAL	8 24
	Total taxa POET	TOTAL	8 24 3
	Total taxa POET Chironomidae taxa		24 3 7
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa		24 3 7 2
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae		24 3 7 2 33.66336634
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae		24 3 7 2
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda		24 3 7 2 33.66336634 22.05882353 7.425742574
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca		24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI		24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon		24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI		24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers %Filterers		24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376 0.495049505
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers %Filterers Total taxa		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376 0.495049505
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	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers %Filterers Total taxa POET Chironomidae taxa		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376 0.495049505
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	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers %Filterers Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae % Amphipoda 'Crustacea + %Mollusca		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376 0.495049505
	Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Orthocladiinae/Chironomidae %Amphipoda %Crustacea + %Mollusca HBI %Dominant taxon %Collector-Gatherers %Filterers Total taxa POET Chironomidae taxa Crustacea taxa + Mollusca taxa % Chironomidae Corthocladiinae/Chironomidae % Amphipoda		8 24 3 7 2 33.66336634 22.05882353 7.425742574 7.920792079 6.851485149 33.16831683 76.23762376 0.495049505
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site score

38

Appendix C

1989 MDT WETLAND MONITORING REPORT
COMPLETED 1998 MITIGATION MONITORING FORM
COMPLETED 1998 FIELD FUNCTIONAL ASSESSMENT FORM
SITE MAP OF THE LAVINA/RYEGATE MITIGATION PROJECTS

MDT Wetland Mitigation Monitoring Lavina Wetland Lavina, Montana



AFP M

April 1989

Wetland Monitoring Report DA Permit No. MT 2SB 0XT 2 009336 Ryegate-East F 14-4(1)129

Note

Special condition F. of the subject 404 permit required that Montana Department of Highway personnel monitor created and enhanced wetland areas on this project for a period of two years after construction.

General

In accordance with the terms and conditions of this permit, the Montana Department of Highways was authorized by the Secretary of the Army to place fill material in Careless Creek and in wetlands adjacent to the Musselshell River in conjunction with a highway construction project in Golden Valley County, Montana. The work took place in Sections 2, 3, and 5, Township 6 North, Range 20 East; Section 35, Township 7 North, Range 20 East; and Sections 4 and 5, Township 6 North, Range 21 East (see figure 1).

The proposed project involved placement of roadway fill on the westerly 7.1 miles of a 15.6 mile highway project on U.S. 12 east of Ryegate, Montana. Site 1 included realigning 700 feet of roadway 50 feet south of the Present Traveled Way (PTW), to make use of an abandoned railroad bed. This work destroyed 0.4 acre of wetlands, while over-excavation of the proposed roadside ditch created 1.6 acres of wetland. Site 2, 1.5 miles east of the project's west end, was also a realignment of 50 feet to the south. Wetland area filled at this location was 0.2 acre. A proposed realignment 2.7 miles east of the project's west end moved the road 50 to 80 feet north and took 0.2 acre of wetland. Obliteration of the PTW in this area (Site 3) created 0.3 acre of wetland.

The new road crossing at Careless Creek, 3.3 miles from the project's west end, involved shifting the highway 60 feet north. The proposed two-span, prestressed concrete bridge at this location (Site 4) replaced an existing 115-foot timber structure, which was removed.



An alignment shift of 30 feet to the north at <u>Site 5</u> resulted in the loss of 0.5 acre of existing wetland. Site 5 is at the downstream end of the 7.1 mile highway project. Some existing pond areas north of the PTW were sub-excavated, thereby enhancing wetland function. In addition, areas to the south and east of the pond sites were subexcavated creating 1.0 acre of wetlands.

In summary, the highway work on this project involved the filling of 1.3 acres of wetlands, while 2.9 acres were created. Some wetland enhancement was also accomplished (see figures 2-5).

Monitoring

Monitoring of created/enhanced wetland sites (1)(3), 5) by Highway Biologists, during a two year period, consisted of visits to the project area in August 1988 and April 1989.

The August 1988 monitoring effort involved visits to sites 1, 3, and 5 to determine if the proposed wetland construction had been accomplished according to permit specifications. Construction at sites 1 and 3 was as specified. Construction at site 5 was as specified, except that proposed wetland construction north of the existing pond site was replaced with an equal area of wetland construction east of the pond sites (refer to figure 5). Photos were taken of sites 1 and 5 and are included with this report as figures 6 and 7 respectively.

The April 1989 monitoring effort involved visits to sites 1, 3, and 5 to determine the extent of water inundation at the sites and if aquatic vegetation had been established (refer to figures 8-10 for 1989 site pictures).

Site 1 was only partially inundated, but the entire site exhibited saturated soils and scattered cattail/rush growth. Site 3 was not inundated, but did exhibit saturated soils and good cattail/rush establishment. Site 5 exhibited water inundation in all subexcavation areas and also a good cattail/rush growth encroachment.



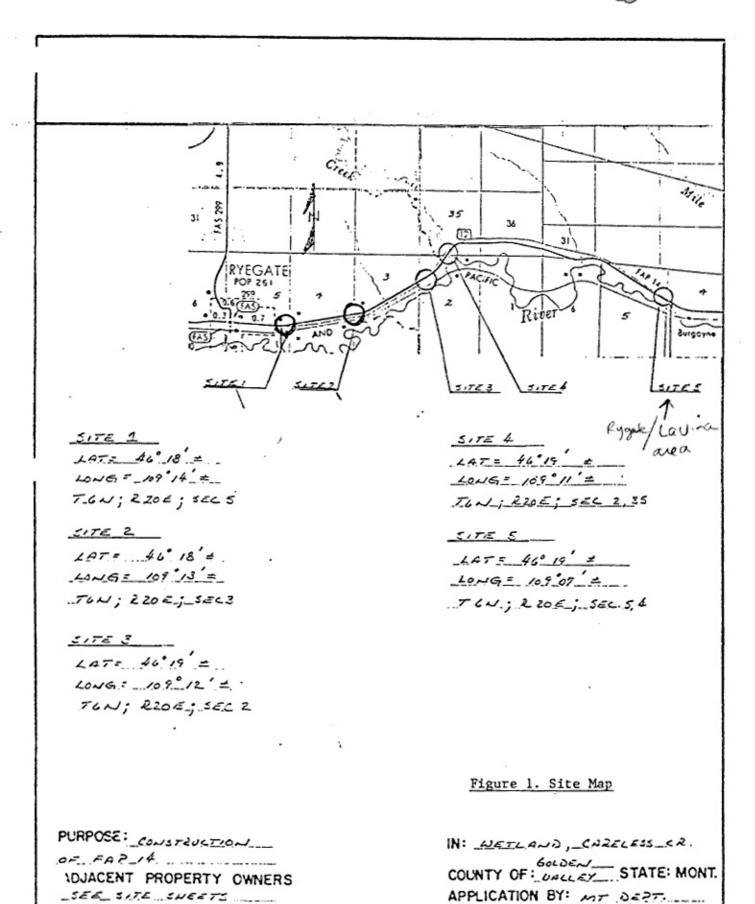
Conclusion

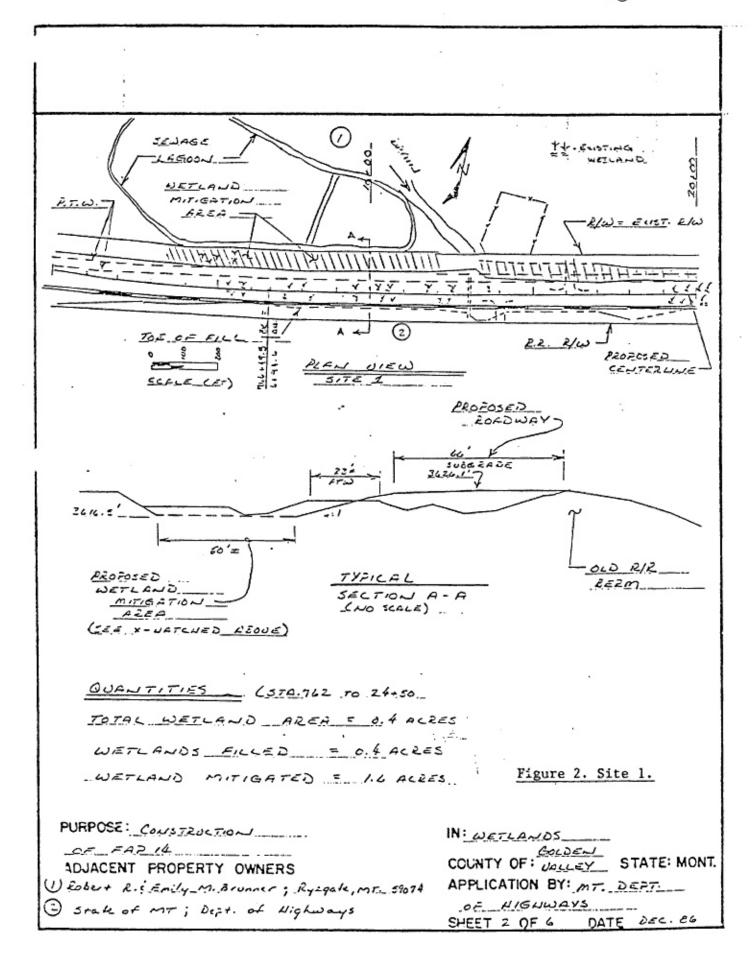
The entire wetland mitigation area of sites 1, 3, and 5 (2.9 acres) appear to meet the corps' three parameter method for wetland determinations. In general, all sites exhibit periodic or permanent water inundation, saturated/hydric soils, and obligate wetland vegetation encroachment.

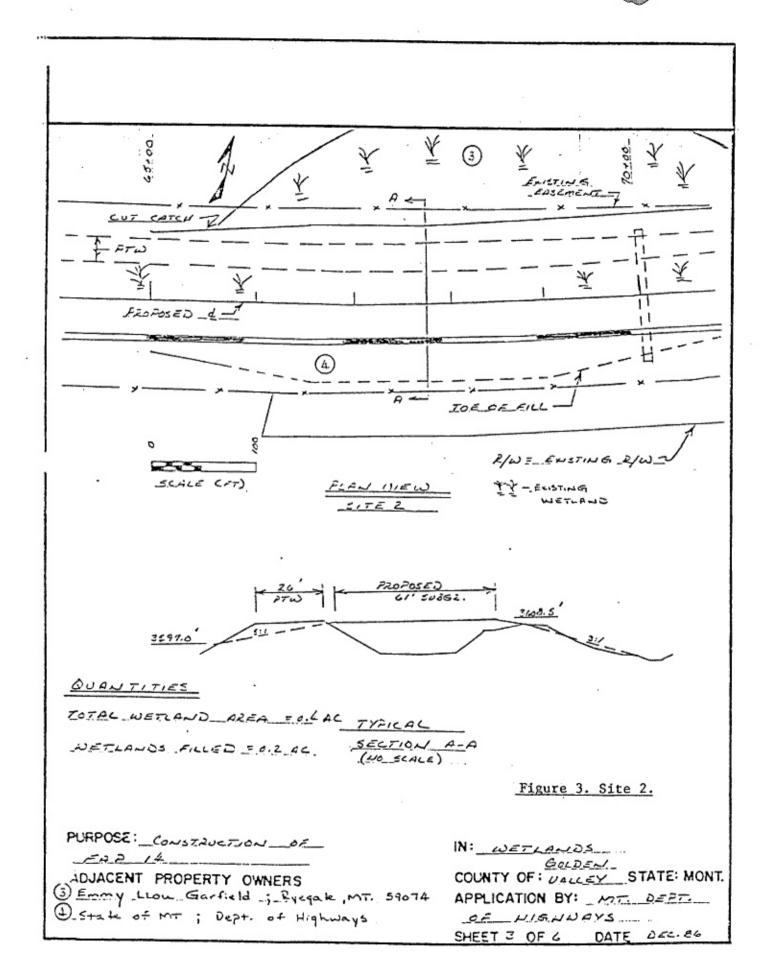
It is also worth noting these sites will likely improve dramatically with normal precipitation conditions, considering their progress to date under some of the severest drought conditions in years.

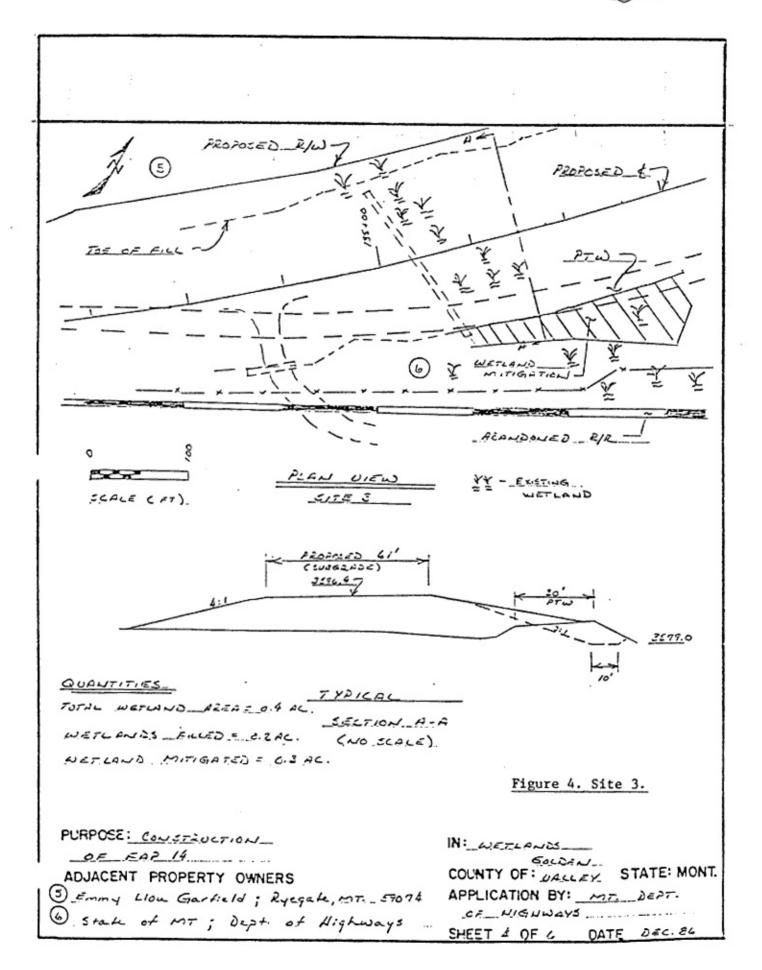
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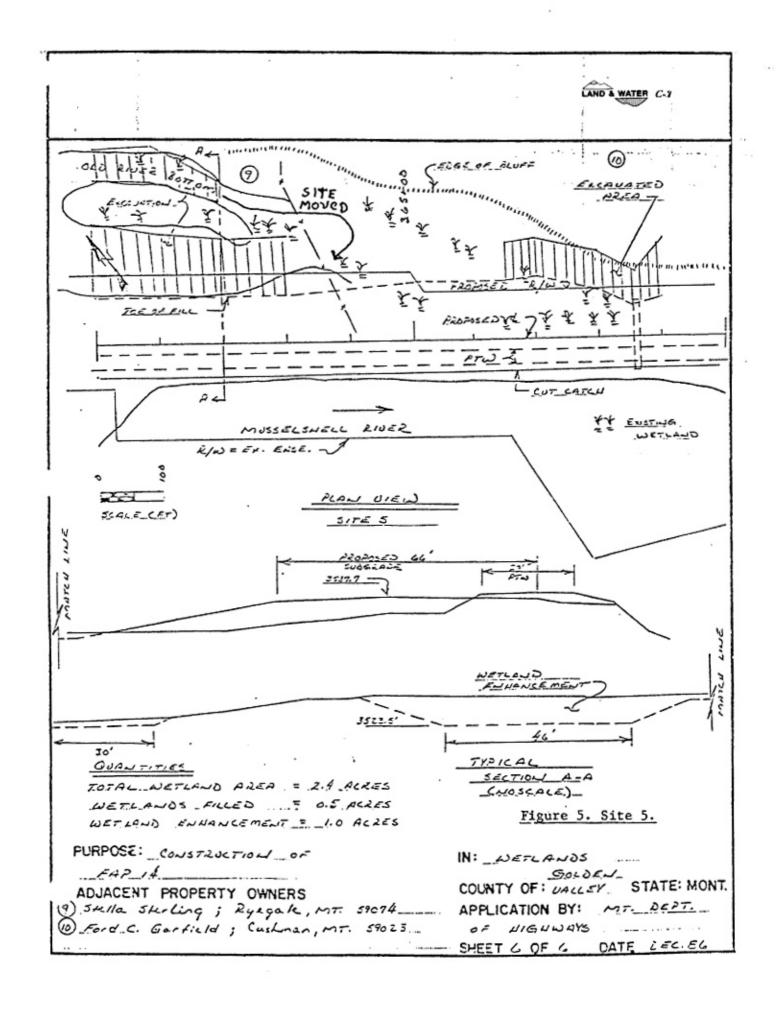
SHEET / OF 6 DATE DEC. 86











MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING FORM

Project: LAVING Wethord mitigation site	Date of Assessment: 7/0/198
Location: Site #1 - LAVING West Legal Description: Section 4 Top 6N Range 21E	Control Number:
Legal Description: Section 4 Tup 6N Range 21E	Boller Valley County, Montera
Time of Day: 2.000m Weather Conditions: Cloudy of	recest with appreciational traits
Wetland Creation: Wetland Restoration: Wetla	nd Enhancement: X
Size of site: Acce Portion of Complex: Person(s) conducting the assessment: Lawrence J. Unbow	Entire site
Person(s) conducting the assessment: LANDENCE J. Unbow	and Timothy Olson
Initial Evaluation Date:	
Sampling Station #: Transe	ect #:
HYDROLOGY:	
Is standing water, Present Yes or Absent on site? Aver	rage Depths: O" To Bicet
What percentage of the Assessment Area is inundated or contains stand	
Range of depths of inundation: to 3 ff	
If the Assessment Area is not inundated, are the soils saturated or is the	re some other evidence of hydrology on site
(i.e. drift lines, erosion, stained vegetation, etc.):	
Has adequate wetland hydrology been achieved in the Assessment Area	
If partial, what percentage of the Assessment Area has adequate wetland	d hydrology? <u>/00</u> %
Remarks: (Sources of hydrology, surface runoff, groundwater, over COMMENTS/PROBLEMS:	
- Area was originally an old oxbow of The	Musselshell Kiver That had
been separated from the main channel of the around 1910. Construction of US Hwy 12 in the	RIVER by RailRoad CONSTRUCTION
around 1910. Construction of US May 12 10 the	The state of the s
from hydrologic flows due to flooding events with	h.W the Mustershed River. In
1988 The Lavina West wetland mitigation site u	ias constructed by the MBT to
expand on the existing . 45 were ox bow to almost	lacre in size.
The project was a combination of creation, ex	Thancement and preservation to
expand on The existing wetland and increase	TS OVERALL SIZE. HYDRELOGY IS
primarily groundwater, but in The spring of 1997,	The Musselshell River overtogged its
banks and flooded Usthey 12 in This region.	The mitigation site was invadated
with floodwaters to a deep of 6 to 8 feet as indicat	led by driff lines in the shows were
along The highway ROW force (MDT mainterwice forces)

WETLAND MON	ITORING -	VEGETATION Date 7/01/98	Project/Site: L quina We	ST MAS WATER C.10
***************************************		Transect #/_	of 4. Examiner: Laureuce v	T. Unbau.
Zone 0 Surrounding upland	l <u>s</u>	Zone 1- Est. width 15 ft. Saturated Periphery	Zone 2- Est. width _/O_ ft. 0-1' depth	Zone 3- Est. width 25 ft. 1-3' depth
yellow clover dested wheatgrass Gumweed silver sage haush Rabbitbaush Populus deltaides Buttalo beery	151 V IV 141VIV 131 V IV 121VIV 121VIE 111 111	Carex Nebrascousis 131+1V Hondown Juhatum 14101V Eleocharis Sp. 121+1V Scingus Acutus 131+1E Typha latifolia 131+1E Polygonum Sp. 121-1E Salix Sp. 1+1-1V Populus delloides 1+101V Geck mannin syzigachuel 21+1V	Alisma gramiveum 1/1+1V Sagitaria curcata 141+1V Polygonum sp. 131-1E Lemna sp. 111+1E Typhalatifolia 131+1E Scinpus Acutus 131+1E Eleocharis sp. 121+1V	Potamogeton pectinens 131+11
Total Vegetative Co	//	Total Vegetative Cover: 20	Total Vegetative Cover: 25	Total Vegetative Cover: 25
Cover estimate: + = <1% 1 = 1-5% 2 = 6-10%	3 = 11-20% 4 = 21-50% 5 = >50%	Indicator class: + = Obligate - = Facultative/Wet 0 = Facultative U= Upland	Source: P = Planted V = Volunteer E = Existing	
Percent of perimeter	<u>75</u> % devel	oping wetland vegetation - excluding	g dam/berm structures.	

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at a point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 ft wide "belt" along the transect lenght.

At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.



WILDLIFE:

Species observed utilizing site during visit (include # observed):

BIRDS	MAMMALS	HERPTILES	INVERTEBRATE	OTHERS
wood ducks (b)	Muskrat	wester parted	Whizligig Beetles	
mulland ducks (b)	Dunesticuted HERSES	Gopher SNAKE	mesquite species	
Cavida Geeselb)	RALCOCK (TROCKS)	western gaster snake	water	
Gesat Blue Heron	Coyote (reacks)	wester Ratikswake		
Easteen King biled	Deer Mule (2) Does (1) famo	Churus frog	DROGONFLY	
Common Grackle	Meadow vole	respond frog	Demselfly Lakve	
Red winged Blackbind		,	Isopods	
Spotted sandpiper			Gamarus sp.	
Killdeer				
N.A.Thew Flicker				i
Nerther Opiole (b)				
Sporkow				
- liff swellows				
BANK Swallows				

wallows				
wallows				
Animal Sig	ne Observed (See	ng (b), feeding (f), migr ts, tracks, nests, herbiv mallaced ducks and Several oxide wes withe island, but we	om: burrous oto	F P
Types: Pla Oth Are the ne	tforms	Nest Boxes eing utilized: YES	Nest bales:	



FUNCTIONAL ASSESSMENT: (Utilizing the MDT Wetland Site Evaluation Form)

Indicate the wetland functions currently observable and their relative value in the Assessment Area wetland system
(low, moderate, or high). Attach MDT forms.
What additional wetland functions can be projected for the Assessment Area?

1. Flood Retention of stopmentes and reading entert appears to be occuping on site as existenced by drift lives on fine and shrubs.
occupring on site as evidenced by drift lives on find and shrubs.
2
3
5.
4.
5
Is the wetland mitigation site approaching the original project goals? YES NO If no, describe the actions necessary to improve the Assessment Area to create a functional wetland system.
COMMENTS / RECOMMENDATIONS TO CORRECT PROBLEMS OBSERVED:
Hydrology: - It appears that adequate hydrology is feeling the wethout system from a Number of sources.
Vegetation: Vegetation within the wetland camplex has been subjected to a Number of herbivorous animals. Evidence of greese and muskents feeding on accommends and energing bullousies is apparent within all the shallow water areas of the site. Wildlife: - Might be Nice to install some wood duck boxes in some of the cottonwood trees around the facility. These would have to have some type of predator guards installed to prevent raccom predation,
Other (Soils, Functions, etc.): Soils are beginning to show characteristics of exidation / reduction with inou concretions, gleying and organic matter brildy on The bottom of the impoundment.
PHOTOS:
Were Photographs taken from original photo station points? YES X NO
(Photos should be taken at approximately the same time each year)
Is a site map attached? YES X NO NO X - None to identify Are problem areas identified on the map? YES NO X - None to identify
The problem areas identified on the map? TES NU \times - NONE 40 ALLOTING



Montana Wetland Field Evaluation Form (revised 9/23/1997, DRAFT)

						UR bow 5. Wetlands/Site #(s) Lav. Na. W.	
etland Loca i. Geograph ii. UTM:	tion(s): i. l	egal: Twr : Degrees_ iv. V	nshp. <u>6</u> 46 : I Vatershe	_(N) _ω S; Range Min/β_; Sec. d: _/_0_0_4	<u>21</u> (€. V ; Lor ; Lor	1; Section 4; 4S. ; 44S. ; 44AS. ; 44A	S
opeving	g ton to	em Ro	ad to	boars	77 07	US HIGHWAY IT IMENAL TENCETYET	
Evaluating Purpose o Wetla Mitiga	Agency: f Evaluation nds potenti tion wetlandation wetlandation	MD on: ally affecte ds; pre-cor	of by MD	_; 8 T project	. Wetland	### 1.2 (visually estimated) ### 2.2 (visually estimated) ### 2.2 (visually estimated) ### 2.2 (visually estimated) ### 2.2 (visually estimated) ### 2.3 (visually estimated)	GPS)
Other		HGM accom	ding to Bri	nson, first column;	USFWS acc	ording to Cowardin[1979], remaining columns)	
A Class	System	Subsyst	Class	Water Regime	Modifier	Dominance Type	% of AA
ve.he	Palustan		AB	Premovently Flooded	.0	Atamegetousp., myriophyllun Flasting + pooted various plants	45
ree.he	Palusta, au		Em	preminently flooded	0	Typha Patitolia, scinpus acutus, polygowang.	40
vee.we	Palvstrive	-	EM	flooded	0	Hildern Jubatom, Carex nobresceusis Scraps across, typha latifelia Salix sp., populus deltuides	10
veche	Palvstana	_	SS	Secsently fatorete	10	Salix sp. , populus deltuides	5
							_
	ļ						_
ent Wetland (EM), ystem: Riverine (R Regimes: Interm	Scrub-Shrub We ly Subsyst: Lo Hently Exposed (elative abu	tland (SS), For wer Perecrial (2 (G), Semiperma ndance: (e	osted Wetland 2y Classes: R mensly Floods of similarly	d (FO) System: Lecustr B, UB, AB, US, EM Sub- ad (F). Seasonally Floode / Classified sites with	ine (L), Subsys system: Upper F d (C), Temporari thin the same	tion (UB), Aquetic Bed (AB), Unconsolidated Shore (US), Moss-lichen Welts t: Limetic (2) Classes: RB, UB, AB Subsystem: Littoral (4) Classes: RB, erennial (1) Classes: RB, UB, AB, US/ by Fooded (A), Intermittently Flooded (J) From world y flooded (J) e Major Montana Watershed Basin, see definitions) Abundant Systems can be found within The Mu	(B, AB,
Comments ii. Weedy, a	ng disturba : (types of d alien, & int	nce: (circle disturbance roduced s	e, intensi pecles (i	e definitions) ty, season, etc.): including those weed sp	1/2 of not domes	wettern area is being heavily grazed iticated, feral): (list) The site appeared	l. 1 to E
i. Number	of NWI clas	ses w/ pe	rsistent		le points)	urring at level of water regime [equal NWI classes, #10 about 3 classes = 5 pts. 2 classes = 3 pts. ≤ 1 class = 1 ot.	
	1 <u>3)x(11</u>	2)=	6	Taa	1.	_	
Score Is:	• 10		59	2-3	1		
Score Is:		antional	High.	Modern		•	
Score Is:	Exc	eptional	(High)	Moderat	e Low		



SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

5/ sbitat for Federa is Documented (Regular use or is de Occasional (infreque Incidental (chance, in No use	ally Listed, P D) or Suspect signated criticant, sporadic)	roposed, ted (S) to cal habita use (list	or Candi receive (d t (list spe species)	date Thre circle one cies) D D	eater): S S	BAID C	angere	d Pla				
Highest Level Use:	doc./reg.	doc	locc.	sus./reg		sus./oc	c.	doc.	/incid.	sus./inc	id.	None
Rating	High	High		Moderat	le	Modera	ite	Low		Low		None
-unctional Points	1.0	0.8		0.7		0.6		0.2		0.1		0.0
Durces for documented Pagles and per- That The well 5B. Habitat for plant AA is Documented Regular use (list sp. Occasional (infrequencidental (chance,	or animals r (D) or Suspected to ent, sporadic	rated S1, ided (S) to	S2, or S3 receive (cospecies)	by the M circle one D D	eca eca onta	ing au	mig vjego I Herita	ge Pi	21 Z	ot including s	astic.	
No use					Š	1						
lighest Level Use:	doc./reg.	doc.	locc.	sus./reg	ļ.	sus./oc	с.	doc	/incid.	sus./inc	id.	None
ating	High	High	1	Modera	te	Modera	ate	Low		Low		None
unctional Points	1.0	0.8		0.7		0.6		0.2		(0.1)		0.0
Non-aquatic birds (list Aquatic/semi-aquatic Non-aquatic mammal Aquatic/semi aquatic Non-aquatic reptiles (Amphibians (list exal Invertebrates (list exal Invertebrates (list exal Invertebrates) (list	mammals (list s (list ex.) reptiles (list ex list ex.) sples) amples) fe Use (circle s's	ex.) & X	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	MOOR NOOR NOOR NOOR NOOR NOOR NOOR NOOR	Non		ego who work at Divers xception e rating	TURA A book	eg Umar c	(circle poi ts) ts.	e.ders	
Score			21)	14	9	7	16	3	3	2	1	
Rating			High	High	Hig	h High	, ,	Mod.	Mod	Low	L	ow
Function	al Points		1.0)	0.9	0.8			0.5	0.4	0.3		.1
D. General Fish H i. circle NA here and i. AA is verified (for portions of th Native fish introduced game i Int ced non-ga	proceed to the V) or suspect eir life cycle fish ame fish	g: (If AA do next function teld (S) to (circle pot V or S	es not cont on)	ain, or is n	ot cor		a fish-bea	aring s or in a	stream or st	anding water	er body [e) KERVED
Score Is: (1 Z)	x (II _ 3) *		10	٦,			-	Т	3.4	2	1	7
Score		15 High	10 High	9 High	_	6) Mod	5 Mod	-+	3,4 Mod	Low	Low	1

1.0

Functional Points

Low

Low

Low

5E. Flood Attenuation and Storage: (applies only to wetlands subject to flooding via in-channel or overbank flow).; If wetlands in AA ided from in-channel or overbank flow, circle NA here and proceed to next function. (see 15L for Dynamic Surface Water Storage) iii. AA contains no outlet or restricted outlet = (1 pt sti. .ed acreage of jurisdictional ii. Estimated % of flooded wetland classified AA contains unrestricted outlet as forested (fo), scrub-shrub (ss) or both tland I the AA that is subject to rodic flooding (circle points) > 75% fo/ss = 3 pts. 25-75% fo/ss = 2 pts. oded wetlands ≥ 10 acres = 7 pts. <25% fo/ss oded wetland <10 ac., >2ac. = 5 pts. oded wetlands ≤ 2ac. €1 pt Score is: $([i] \times [ii]) + (iii] = 2$ 2) 22 16-21 14-15 11 8-10 6-7 5-4 3 Score Mod. Low (Low) Low Rating High High High High Mod. Mod. 0.2 0.6 0.3 Functional Points 0.7 0.5 0.9 1.0 and Storage The a Hervation due 10 Rates Comments: 0120 10 u , NUNDations 20 Sediment/Nutrient/Toxicant Retention and Removal: (Circle true [T] or false [F] for each of the following statements) AA receives direct discharge of managed water (municipal or road stormwater, agricultural drainage, industrial/municipal wastewater) or accumulation of sediment/excess nutrients evident (deposits on vegetation, algal mats or other signs of eutrophication present) or immediate upstream land use potential to deliver significant sediment/nutrient Evidence of flooding or ponding occurs in AA AA contains restricted outlet or no outlet such that flow is slowed or retarded. Percent cover of emergent and/or dense woody vegetation in the AA exceeds 50% (i) is true and at least two of (ii), (iii), or (iv) are true High Rating Rating of Category: = Moderate Rating Rating is neither High nor Low (I) is false and at least two of (ii), (iii), or (iv) are false = Low Rating NA NA NA Score High Mod Low Rating 0.5 0.1 Functional Points 4.0 within the refer tion is occurring sediment and G Sediment/Shoreline Stabilization: (applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made rage, or on the shoreline of a standing water body which has a maximum depth exceeding 6.6 ft, at low water (e.g. subject to wave action). If does apply, circle NA here and proceed to next function; in items I-iv below, circle choice) ii. Water body adjacent to rooted vegetation is i. Estimated % cover of rooted vegetated component in AA 5 points Permanent/Perennial >30% rooted vegetation 3 points 3 points Seasonal/Intermittent 10-30% rooted vegetation 2 points 2 points <10% rooted vegetation 1 point Temporary/Ephemeral Score is: (i__) x (ii 6 5 3 2 15 10 Score Low Low Mod. Mod. Mod. High High High Rating 0.1 0.7 0.4 0.2 0.9 8.0 0.5 Functional Points 1.0 feet in depth There fore of wetlawa exceea6.6 Comments: NOT + applicable be This Some should we at The North wa USE of Site for H. Production Export/Food Chain Support: (Circle appropriate choice in i-iv below) li. Habitat Diversity Rating: (from #13) i. Acreage of vegetated component in AA: 3 points >5 acres 10 points High-Exceptional = 2 points 1-5 acres 5 points Moderate 1 point Low <1 acre 1 point iv. Surface water in AA is: iii. Outlet presence: 3 points Permanently/Perennial ntains an outlet = 3 points ДД (1 point 2 points Seasonal/Intermittent A. tains no outlet = 1 point Temporary/Ephemeral Score is: $[(1 5) \times (11 3)] + [(111 /) \times (1 \times 3)] = /8$ 3 2 8-9 5-6 4 21-36 16-19 10-14 Score 39

Rating

High

High

Hlgh)

Mod.

Mod.

Mod.

VegetationWetland oSeeps are _X_AA permai	e knowr growin ccurs at present nently flo	or observed g during dorn the toe of a t at the wetla	nant seas natural sk nd edge drought p	on/droug	iiF ghtV Rating AA is k No D/R	Permea Vetland Other for Dis nown D	ble substr contains charge(I R area o	ate prese inlet but 0)/Recha r one or a	ent withou no outlet rge(R) Pr more indic	operties ators of	: D/R pre	sent =	High Low)
	1	Score			NA	ne D/K	NA	n inaded	uate to ra	te AA D/	K poten	tial =	Uhkn
		Rating					AO		Unknown				
			Delete.		High)		Low)						
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groundwat water lev	es le	ter elevi	ations	within	to and	to FA	Victorite	with	River	Jevels		W 19	98_
I. Uniqueness: i. Estimated relative sites within the Marker = 3 p. Common	Major Wa oints oints oints	ndance of similaritershed Basin	ilarly class n (#11, circ	sified le)	II. Repla AA is/con AA does AA does	acement stains fen, not contai not contai	t potential bog, warm s in above cite in above type	habitat di prings or m d types but es and habit	iversity (#1 lature (>80 yr diversity is hi lat diversity is	12, circle p forested w igh-exception flow-model	ooints) ettand = 1 onal = 3	0 points	
Score is [(i_Z) x (II_	<u>3)] + (III) =</u>	2 33	31-32	22-23	12-21	10-11	(8-9)	5,6,7	4	2-3	1	ĺ
Rating			High	High	High	High	Mod.	Mod.	Mod.	Low	Low	Low	
ictional	Points		1.0	0,9	0.8	0.7	0.6	0.5	0.4	0.3	0.2		
i. Recreation/ii. Check cated ii. Based on t (If yes, go to Condition of	Houds Educati gories to he locati o ii, then of AA: (i) of AA:	on Potential hat apply to tion, diversit proceed to if from #12, circle points	: i. Is the the AA: _ ty, size, a v; if no, the cle points)	AA a kn Educa nd othe en rate a	own rec.le ational/scient r site attrib as Low [0.1] isturbed = 3	d. site: ific study outes, is pts; Er	(circle) \(\frac{1}{2}\) (circle) \(\frac{1}{2}\) (circle) \(\frac{1}{2}\) (circle) \(\frac{1}{2}\) (circle) \(\frac{1}{2}\) (circle) \(\frac{1}{2}\)	(N) (If y sumptive r trong pot	es, rate as ec.; No tential for	High and on-consur- rec./ed.	go to li; i nptive re use?	f no go	
	Score		6		4	3		2	1		1		
	Rating		High	1	Mod.	Mod	i.	(low)	Lo	w		,	
		nal Points	1.0		0.7	0.5		(0.3)	0.		1	,	
omments: VS High plent			1 4 00		ecreption					stly o	diore 11 si	2+ +	wdis
surface flow, on Estimated and A subject to looded wetlar	r ground creage (period) nds ≿ 5 : led wetlands < 1 :	acres and > 1 acre acre	no jurisdictional wetla circle point = 3 p	onal wetta and in th ts) points	inds in the A	A are su li. Es Weti	bject to flo stimated and flood	oding, circ flood fre s ≥ 5/10	hannel flow le NA here quency (o years = years =	and proce ircle poi 2 points	ed with the	dpitation	n, uation.)
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	Fu	inctional Poir	nts		1.0	(0.8)	0.	5	0.3	0.1			_
mments:_		site has	a hig	6 pot	estia/	tés.	svæta e	e ws	ten Sh	rage	as 7	he s	condo

FUNCTION & VALUE SUMMARY & OVERALL RATING

or. [°] alue Variables	Rating	Actual Functional Points	Possible Function al Points	Functional Units; (Actual Points x Estimated AA Acreage) 6 0 6 =	w
ted/Proposed/Candidate T&E Species Habitat	1	04	1 .	, 096	
Natural Heritage Program Species Habitat	L	0.1	1	.096	
neral Wildlife Habitat	14	1.0	1	, 90	
neral Fish/Aquatic Habitat	/M	0.7	1	.67	
od Attenuation and Storage	LL	6.2	1	. 19	
iment/Nutrient/Toxicant Removal	1	1.0	1	.96	
timent/Shoreline Stabilization	NA	-	-		
duction Export/Food Chain Support	H	0.8.	1 .	. 769	
undwater Discharge/Recharge	11	1.0	1	,96	
lueness	m	0.5	1	.48	
reation/Education Potential	T.	0.3	1	.289	
amic Surface Water Storage	U.	8,6	1	.768	
		6.6	11	6.236	

.59 : 5170

L A. .. .LYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below)

111

I۷

ry I Wetland: (Must satisfy one of the following criteria; if does not meet citeria; go to Category II) core of 0.9 or 1 functional point for Listed/Proposed/Candidate Threatened or Endangered Species; or core of 0.9 or 1 functional point for Uniqueness or "High" rating for Uniqueness and Condition (#12) is "Undisturbed"; or core of 1 functional point for Flood Attenuation and Storage and answer to Question 12:E3 is "yes"; or otal actual functional points > 80% (round to nearest whole #) of total possible functional points.

y II Wetland: (Criteria for Category I not satisfied but meets any one of the following criteria sie one satisfied but meets any one of the following criteria sie of the control of the c core of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or core of 1 functional point for General Wildlife Habitat; or

-ligh" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or

High" rating for Uniqueness or

otal Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

y III Wetland: (Criteria for Categories I, II or IV not satisfied: International Criteria for Categories I, II or IV not satisfied: International Criteria for Categories I, II or IV not satisfied: International Criteria for Categories I, II or IV not satisfied: International Criteria for Categories II or IV not satisfied: International Criteria for Categories I, II or IV not satisfied: International Criteria for Categories I, II or IV not satisfied: International Criteria for Categories II or IV not satisfied: International Criteria for IV not satisfied: International Criteria for IV

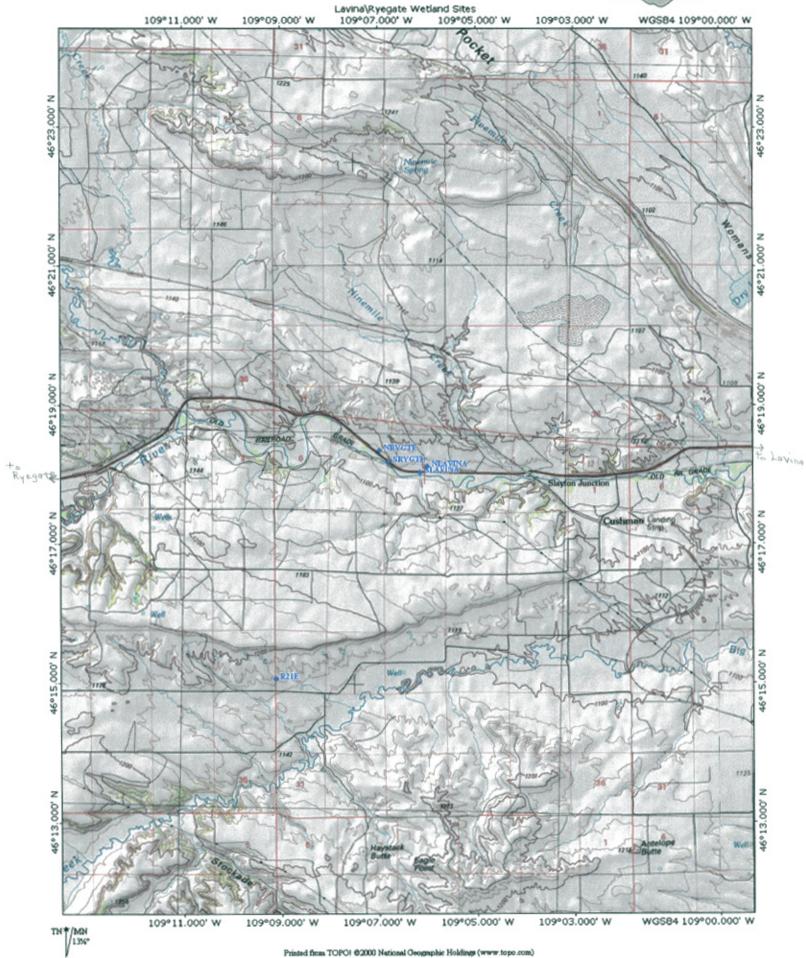
y IV Wetland: (Criteria for Categories I or II are not satisfied Incompany of the following street and the satisfied Incompany of the sat 医金沙州

ow" rating for Uniqueness; and (should this be so s?)

.ow" rating for Production Export/Food Chain Support; and

otal actual functional points < 30% (round to nearest whole #) of total possible functional points

this is likely just for "Lavina" (and not egate").
in clusive of "Ryegate").



Appendix D

BIRD SURVEY PROTOCOL
MACROINVERTEBRATE SAMPLING PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring Lavina Wetland Lavina, Montana



BIRD SURVEY PROTOCOL

The following is an outline of the MDT Wetland Mitigation Site Monitoring Bird Survey Protocol. Though each site is vastly different, the bird survey data collection methods must be standardized to a certain degree to increase repeatability. An Area Search within a restricted time frame will be used to collect the following data: a bird species list, density, behavior, and habitat-type use. There will be some decisions that team members must make to fit the protocol to their particular site. Each of the following sections and the desired result describes the protocol established to reflect bird species use over time.

Species Use within the Mitigation Wetland: Survey Method

Result: To conduct a bird survey of the wetland mitigation site within a restricted period of time and the budget allotment.

Sites that can be circumambulated or walked throughout.

These types of sites will include ponds, enhanced historic river channels, wet meadows, and any area that can be surveyed from the entirety of its perimeter or walked throughout. If the wetland is not uncomfortably inundated, conduct several "meandering" transects through the site in an orderly fashion (record the number and approximate location/direction of the transects in the field notebook; they do not have to be formalized or staked). If a very small portion of the site cannot be crossed due to inundation, this method will also apply. Though the sizes of the site vary, each site will require surveying to the fullest extent possible within a set time limit. The optimum times to conduct the survey are in the morning hours. Conduct the survey from sunrise to no later than 11:00 AM. (Note: some sites may have to be surveyed in the late afternoon or evening due to time constraints or weather; if this is the case, record the time of day and include this information in your report discussion.) If the survey is completed before 11:00 AM and no additions are being made to the list, then the task is complete. The overall limiting factor regarding the number of hours that are spent conducting this survey is the number of budgeted hours; this determination must be made by site by each individual.

In many cases, binoculars will be the only instrument that is needed to identify and count the birds using the wetland. If the wetland includes deep water habitat that can not be assessed with binoculars, then a scope and tripod are necessary. If this is the case, establish as many lookout posts as necessary from key vantage points to collect the data. Depending on the size of the open water, more time may be spent viewing the mitigation area from these vantage points than is spent walking the peripheries of more shallow-water wetlands.

Sites that cannot be circumambulated.

These types of sites will include large-bodied waters, such as reservoirs, particularly those with deep water habitat (>6 ft) close to the shore and no wetland development in that area of the shoreline. If one area of the reservoir was graded in such a way to create or enhance the development of a wetland, then that will be the area in which the ambulatory bird survey is conducted. The team member must then determine the length of the shoreline that will be surveyed during each visit.



As stated above in the ambulatory site section, these large sites most likely will have to be surveyed from established vantage points.

Species Use within the Mitigation Wetland: Data Recording

Result: A complete list of bird species using the site, an estimate of bird densities and associated behaviors, and identification of habitat use.

1. Bird Species List

Record the bird species on the Bird Survey - Field Data Sheet using the appropriate 4-letter code of the common name. The coding uses the first two letters of the first two words of the birds' common name or if one name, the first four (4) letters. For example, mourning dove is coded MODO and mallard is MALL. If an unknown individual is observed, use the following protocol and define your abbreviation at the bottom of the field data sheet: unknown shorebird: UNSB; unknown brown bird (UNBR); unknown warbler (UNWA); unknown waterfowl (UNWF). For a flyover of a flock of unknown species, use a term that describes the birds' general characteristics and include the approximate flock size in parentheses; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded: UNBB / FO (25). You may also note on the data sheet if that particular individual is using a constructed nest box.

2. Bird Density

In the office, sum the Bird Survey – Field Data Sheet data by species and by behavior. Record this data in the Bird Summary Table.

3. Bird Behavior

Bird behavior must be identified by what is known. When a species is simply observed, the behavior that it is immediately exhibiting is what is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair individual (BP); foraging (F); flyover (FO); loafing (L; e.g. sleeping, roosting, floating with head tucked under wing are loafing behaviors); and, nesting (N). If more behaviors are observed that do have a specific descriptive word, use them and we will add it to the protocol; descriptive words or phrases such as "migrating" or "living on site" are unknown behaviors.

4. Bird Species Habitat Use

We are interested in what bird species are using which particular habitat within the mitigation wetlands. This data is easily collected by simply recording what habitat the species was initially observed. Use the following broad category habitat classifications: aquatic bed (AB - rooted floating, floating-leaved, or submergent vegetation); forested (FO); marsh (MA - cattail, bulrush, emergent vegetation, etc. with surface water); open water (OW - primarily unvegetated); scrubshrub (SS); and upland buffer (UP); wet meadow (WM - sedges, rushes, grasses with little to no surface water). If other categories are observed onsite that are not suggested here, we will make a new category next year.



D-2

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

- D-frame sampling net with 1 mm mesh. Wildco is a good source of these.
- Spare net.
- 1-liter plastic sample jars, wide-mouth. VWR has these: catalog #36319-707.
- 95% ethanol: Northwest Scientific in Billings carries this.

All these other things are generally available at hardware or sporting goods stores. Make the labels on an ink jet printer preferably.

- hip waders.
- pre-printed sample labels (printed on Rite-in-the-Rain or other coated paper, two labels per sample).
- pencil.
- plastic pail (3 or 5 gallon).
- large tea strainer or framed screen.
- towel.
- tape for affixing label to jar.
- cooler with ice for sample storage.

Site Selection

Select the sampling site with these considerations in mind:

- Select a site accessible with hip waders. If substrates are too soft, lay a wide board down to walk on.
- Determine a location that is representative of the overall condition of the wetland.

Sampling

Wetland invertebrates inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. Your goal is to sweep the collecting net through each of these habitat types, and then to combine the resulting samples into the 1-liter sample jar.

Dip out about a gallon of water into the pail. Pour about a cup of ethanol into the sample jar. Fill out the top half of the sample labels, using pencil, since ink will dissolve in the ethanol.

Ideally, you can sample a swath of water column from near-shore outward to a depth of approximately 3 feet with a long sweep of the net, keeping the net at about half the depth of the water throughout the sweep. Sweep the water surface as well. Pull the net through a vegetated area, beneath the water surface, for at least a meter of distance.

Sample the substrate by pulling the net along the bottom, bumping it against the substrate several times as you pull.



This step is optional, but it gives you a chance to <u>see</u> that you've collected some invertebrates. Rinse the net out into the bucket, and look for insects, crustaceans, etc. If necessary, repeat the sampling process in a nearby location, and add the net contents to the bucket. Remember to sample all four environments.

Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar.

If you skip the bucket-and-sieve steps, simply lift handfuls of material out of the sampling net into the jars. In either case, please include some muck or mud and some vegetation in the jar. Often, you will have collected a large amount of vegetable material. If this is the case, lift out handfuls of material from the sieve into the jar, until the jar is about half full. Please limit material you include in the sample, so that there is only a single jar for each sample.

Top off the sample jar with enough ethanol to cover all the material in the jar. Leave as little headroom as possible.

It is not necessary to sample habitats in any specified order. Keep in mind that disturbing the habitats prior to sampling will chase off the animals you are trying to capture.

Complete the sample labels. Place one label inside the sample jar and tape the other label securely to the outside of the jar. Dry the jar before attaching the outer label if necessary. In some situations, it may be necessary to collect more than one sample at a site. If you take multiple samples from the same site, clearly indicate this by using individual sample numbers, along with the total number of samples collected at the site (e.g. Sample #3 of 5 total samples).

Photograph the sampled site.

Sample Handling/Shipping

- In the field, keep collected samples cool by storing them in a cooler. Only a small amount of ice is necessary.
- Inventory all samples, preparing a list of all sites and enumerating all samples, before shipping or delivering to the laboratory.
- Deliver samples to Rhithron.



GPS Mapping and Aerial Photo Referencing Procedure

The wetland boundaries, photograph location points and sampling locations were field located with mapping grade Trimble Geo III GPS units. The data was collected with a minimum of three positions per feature using Course/Acquisition code. The collected data was then transferred to a PC and differentially corrected to the nearest operating Community Base Station. The corrected data was then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet.

The GPS positions collected and processed had a 68% accuracy of 7 feet except in isolated areas of Tasks .008 and .011, where it went to 12 feet. This is within the 1 to 5 meter range listed as the expected accuracy of the mapping grade Trimble GPS.

Aerial reference points were used to position the aerial photographs. This positioning did not remove the distortion inherent in all photos; this imagery is to be used as a visual aide only. The located wetland boundaries were given a final review by the wetland biologist and adjustments were made if necessary.

Any relationship of features located to easement or property lines are not to be construed from these figures. These relationships can only be determined with a survey by a licensed surveyor.

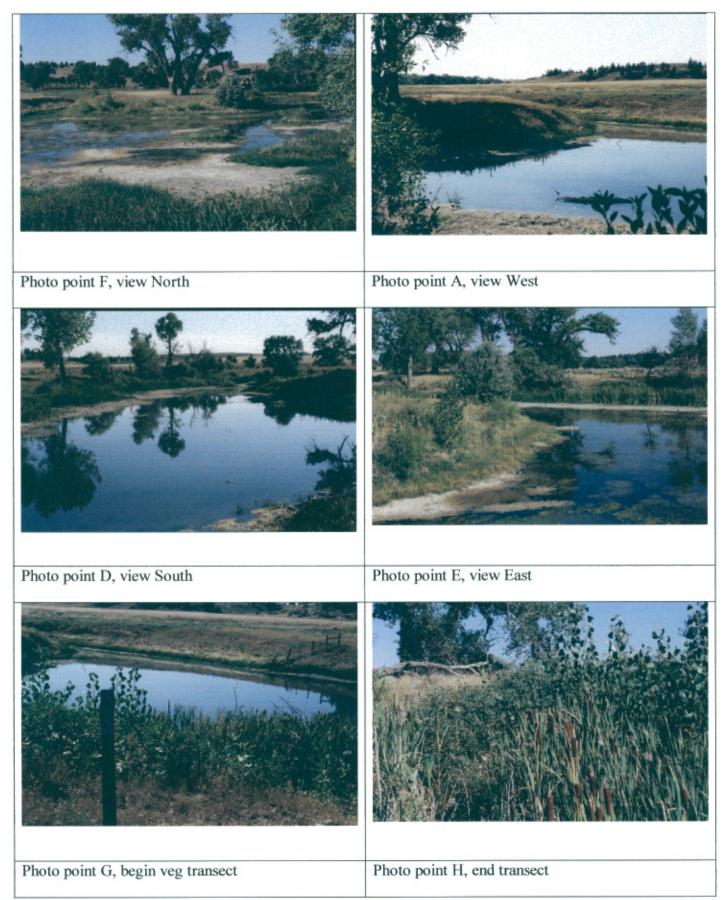


Appendix E

REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring Lavina Wetland Lavina, Montana





2001 Lavina Wetland Sheet 1



